

THE SILVER INSTITUTE LETTER

INFORMATION ON SILVER FOR INDUSTRY

VOLUME X, NUMBER 9

OCTOBER, 1980

SILVER COMPOSITION HEALS BURN VICTIMS

Thousands of the world's hospitals use silver sulfadiazine to treat hundreds of thousands of persons on every continent who are hospitalized each year for serious burn injuries.

To understand the seriousness of burns, one must understand the importance of skin. A recent report of the **Washington Hospital Center** of Washington, D.C., noted that skin "shields us from armies of hostile microorganisms, all eager to wreak havoc inside the body . . . When a severe burn destroys the skin, it is destroying our defenses against devastating fluid loss, deadly infection and uncontrolled temperature extremes," and in the case of the most serious burns "the wound becomes a fertile breeding ground for infection and an immediate danger to life."

"Silver sulfadiazine cream is used to effectively combat the very grave risk of infection because it can **eliminate hundreds of organisms, including Gram-positive and Gram-negative bacteria and fungi**, and by being applied directly to the burned area, the silver sulfadiazine cream can overcome bacteria when standard antibiotics do little good because the blood vessels that might take them to the injured area have been destroyed. This cream also has remarkable healing properties which help speed the patient's recovery," according to the doctor whom the American Burn Association honored for his pioneer research in this field, Charles L. Fox, Jr., M.D., Professor of Microbiology, Columbia University College of Physicians and Surgeons, 622 W. 168th Street, New York, N.Y. 10034.

A report by **Marion Laboratories**, 10236 Bunker Ridge Road, Kansas City, Missouri 64137, manufacturer of Silvadene Cream (silver sulfadiazine, micronized), indicates that in addition to the healing powers and germ-killing efficacy of this compound, "Silvadene Cream's application on burned patients is virtually painless. Frequent applications of Silvadene are not needed. Dressings are nonadherent and easily changed without the use of analgesics. When burns are well-covered, patients feel warm, there is less loss of heat, and surface evaporation of water is diminished. It does not stain linen, dressings, or patients."

Silver sulfadiazine creams are also manufactured as Flamazine by **Smith & Nephew**, 2 Temple Place, London WC2R 3BP England and by Smith & Nephew Ltd., 2100 52nd Avenue, Lachine, Quebec, Canada. **Philips-Duphar Nederland BV**, Postbus 7133, Amsterdam, The Netherlands, produces it as Flammazine. The silver sulfadiazine composition is also produced in Germany, India, Israel, Mexico and Spain, extending its healing benefits throughout the world.



Above, left. Marion Laboratories produces Silvadene. Right. Using Flammazine in Barcelona, Spain. Both medicines contain silver sulfadiazine.

VIKINGS, OLYMPIC MEDALISTS AND GYMNASTS ADORN SILVER COINS

"Odin's Raven" is the name of the replica of the Viking longship portrayed on the Isle of Man 50 pence sterling silver proof coin shown below. "Odin's Raven" is to form the chief exhibit in an exhibition of Viking culture in New York City, and each coin has an edge-lettered inscription reading ODINS RAVEN VIKING EXHIBN NEW YORK 1980. "Odin's Raven" actually made the voyage



from Norway to the Isle of Man to celebrate the Manx Millennium Viking Voyage, the emblem of which is on the sail of the coin's longship. The Point of Ayre lighthouse is in the background because it was the modern Vikings first landfall on the Isle of Man. Additional information about this coin may be obtained from Pobjoy Mint Ltd., Mint House, Oldfields Road, Sutton, Surrey, England.

The largest and heaviest silver coin currently being issued, above right, is Jamaica's \$25.00 proof 500 fine silver coin which measures 63 mm in diameter and weighs 2,100 grains, honors Jamaica's Olympic Gold Medal winners of track and field events. Jamaica's five medalists portrayed on this coin are Arthur Wint (1948 Olympics), George Rhoden, Leslie Laing and Herbert McKenley in 1952 in the Helsinki, Finland games, and Donald Quarrie in Montreal in 1976. This coin can be purchased from Paramount International Coin Corporation, One Paramount Plaza, Englewood, Ohio 45322.

In Czechoslovakia, a beautiful 500 fine silver 100-korun commemorative coin was struck to mark the holding of the fifth international exhibition of gymnastic skills. Featuring a line of 8 standing girl gymnasts, this coin may be ordered from ARTIA, Smecky 30, Prague 1, Czechoslovakia.



SILVER INSTITUTE BOARD MEETS IN SAN FRANCISCO

On September 23rd, Institute Chairman Charles D. Snead, Jr. presided at The Silver Institute Board Meeting in San Francisco. Richard L. Davies, Executive Director, reported on the Institute's increasingly important work in developing new uses of silver and in providing precise and timely statistics. He also reported that the staff is working with the U.S. Bureau of Mines and a film production firm in New York City in developing an **updated version of the motion picture film, SILVER.**

A 27-minute production, **SILVER** will show current safe mining practices, refining processes and illustrated descriptions of present-day industrial and traditional uses of silver. The properties of silver that make it one of man's most valuable industrial metals—its ability to conduct electricity and heat, reflect light, resist oxidation and corrosion, and retain its strength despite severe distortion—are all described. Financed by the members of The Silver Institute, the **SILVER** film will be ready for viewing by February 2, 1981.

Mr. Davies noted that, as in the past, 16 mm prints of **SILVER** will be available for circulation on a free-loan basis to scientific, educational, civic, professional and business organizations and other responsible groups from Motion Pictures, Bureau of Mines, U.S. Department of Interior, 4800 Forbes Avenue, Pittsburgh, Pennsylvania 15213.

The President of The Silver Institute, Bernhard Rohe of Industrias Peñoles, S.A. of Mexico, reported on the progress of The Silver Institute and the silver industry from the point of view of member companies which mine silver. He then called on Past Vice President of the Institute, Alex Schmidt-Fellner of AMAX Inc. to report on the silver refiner's view of the silver industry. The point of view of member companies which manufacture silver products was reported by Institute Vice President for Canada, Anthony M.B. Hart of Johnson Matthey Limited. And member of the Institute Board of Directors, J. Robert C. Guy of N.M. Rothschild & Sons of London, England, summarized recent developments in the silver industry, representing member companies which regularly stock silver bullion and regularly supply it to manufacturers.



At left, l. to r., Silver Institute Chairman, Charles D. Snead, Jr.; President, Bernhard Rohe; a Founder and Past Vice President, Alex Schmidt-Fellner; Vice President for Canada, Anthony M.B. Hart and a Board Member, Robert Guy. At right, Jorge Larea of Industrial Minera México, S.A. and Charles Barber of ASARCO Inc.



LONDON MEETING SCHEDULED FOR 1981



During the Institute Board Meeting in San Francisco, member of the Institute Board of Directors, Kenneth R. Barrett (shown at left) of Britannia Refined Metals Limited of London, England, announced that Institute Vice President Werner Knies of Degussa of the Federal Republic of Germany and representatives of other European and African member companies proposed that a Silver Institute meeting be held in London, England on April 27, 1981. Chairman of the Board of The Silver Institute, Charles D. Snead, Jr. of Callahan Mining Corporation asked for a discussion of the proposal. The proposal was enthusiastically endorsed, and the Executive Director was asked to proceed with the necessary arrangements with the cooperation of Mr. Barrett and representatives of other member companies.

NEW BOARD MEMBER ELECTED

The new President of Nippon Mining Co., Ltd. of Japan, Mr. Takanobu Sasaki, was nominated and elected by the Board to be a member of the Silver Institute Board of Directors. Members of the Institute's Board of Directors include citizens of the United States, Australia, England, Canada, Chile, West Germany, France, Peru, Mexico and Japan.

SILVER INSTITUTE DIRECTORS ACTIVE IN AMERICAN MINING CONGRESS

Silver Institute Past President, Robert M. Reininger, (below, left) of Rosario Resources Corporation, chaired the American Mining Congress Session on Processing Gold and Silver Ores on September 23, and the following day, the American Mining Congress Session on Gold and Silver



Economics was chaired by Silver Institute Vice President Bob Ross (shown at right) of Engelhard Industries. Member of the Institute Board, Louis Fox of J. Aron & Co., made a principal address in the Gold and Silver Economics Session. And Institute Vice President, Harry Conger, of Homestake Mining Company, acted as an Official Host of the entire American Mining Congress.



NEW MEMBERS WELCOMED

The Silver Institute warmly welcomes the following new members: **CHL Chemical Corporation**, 35 Maynard Court, Los Altos, California 94022, represented in Institute affairs by its President, Dixon Collins; and **New Orleans Silversmiths Inc.** 600 Chartres Street, New Orleans, Louisiana 70130, with its President, Paul J. Leaman, Jr., as its Official Representative.

NEW SILVER TECHNOLOGY QUARTERLY CELEBRATES SEVENTH YEAR

During the past seven years, each January, April, July and October has seen the publication of 70 of the most significant developments in twenty categories of worldwide research on silver and its products in The Silver Institute's quarterly publication, **NEW SILVER TECHNOLOGY**. For only US \$30.00, **NEW SILVER TECHNOLOGY** will keep subscribers informed of the most important silver developments in 1981.

ORDER FORM for Silver Institute Publications:

Annual Subscription to **NEW SILVER TECHNOLOGY** (US \$30.00) \$ _____

INDEX for 1974-1976 (US \$10.00) \$ _____

INDEXES for 1977, 1978, 1979 and 1980 (each US \$5.00) \$ _____

Enclosed is a check for US \$ _____ in payment for these Silver Institute Publications.

Please make check payable to The Silver Institute and send it together with this form to:

The Silver Institute, 1001 Connecticut Ave., N.W., Washington, D.C. 20036

NAME: _____ COMPANY: _____

(Please print)

ADDRESS: _____

LA'TEST SILVER INSTITUTE REFINING STATISTICS

Production and Disposition of **999 Silver Bars** by All Known Refiners in the United States

	TROY OUNCES	MILLION TROY OUNCES				
	September 1980	Sep 1980	Aug 1980	Jan-Sep 1980	Jan-Sep **1979	Full Yr **1979
THESE REFINERS' PRODUCTION, BY SOURCE						
From Primary (ores & concentrates)	1,882,209	1.9	3.7	3.6	4.9	4.8
From Coins	1,940,345	1.9	0.9	1.8	0.1	0.5
From Old Scrap (used photo film & other products)	3,685,380	3.7	5.4	6.4	5.1	5.2
From New Scrap (in-plant clippings, waste)*	3,277,366	3.3	1.6	2.7	2.0	2.3
TOTAL PRODUCTION	10,785,300	10.8	11.6	14.5	12.1	12.7
TOTAL PRODUCTION Less New Scrap*	7,507,934	7.5	10.0	11.8	10.1	10.4
ABOVE TOTAL PRODUCTION, BY OWNERSHIP						
From Refiners' Own or Purchased Materials	7,656,358	7.7	7.2	9.4	8.9	9.0
Refined on Toll for Others	3,128,942	3.1	4.3	5.1	3.2	3.7
DISPOSITION BY THESE REFINERS						
Converted in Plant (consumed in fabricating, etc.)	5,006,982	5.0	3.2	4.8	3.0	3.1
Shipped Out: Own materials	3,467,406	3.5	3.2	4.8	6.8	7.0
Against Tolls	3,084,104	3.1	4.8	4.9	2.1	2.7
TOTAL DISPOSITION	11,558,492	11.6	11.2	14.6	11.9	12.8
TOTAL DISPOSITION Less New Scrap*	8,281,126	8.3	9.6	11.9	9.9	10.5
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)						
	-773,192	-0.8	+0.4	-0.8	+1.7	-1.3
THESE REFINERS' STOCKS AT END OF PERIOD	789,038	0.8	1.6	0.8	4.6	1.6

Production and Disposition of **999 Silver Bars** by All Known Refiners in Australia, Canada, Mexico, Peru, South Africa and Sweden; and some other Refiners in Europe and Asia.

	TROY OUNCES	MILLION TROY OUNCES				
	September 1980	Sep 1980	Aug 1980	Jan-Sep 1980	Jan-Sep 1979	Full Yr 1979
THESE REFINERS' PRODUCTION, BY SOURCE						
From Primary (ores & concentrates)	11,598,542	11.6	10.6	12.1	12.9	12.7
From Coins	0	0.0	0.0	0.1	0.0+	0.0+
From Old Scrap (used photo film & other products)	7,776,796	7.8	6.9	7.8	3.3	4.1
From New Scrap (in-plant clippings, waste)*	1,411,677	1.4	1.1	1.4	0.7	0.8
TOTAL PRODUCTION	20,787,015	20.8	18.7	21.4	16.9	17.6
TOTAL PRODUCTION Less New Scrap*	19,375,338	19.4	17.5	20.0	16.2	16.8
ABOVE TOTAL PRODUCTION, BY OWNERSHIP						
From Refiners' Own or Purchased Materials	17,041,161	17.0	15.2	17.5	14.5	15.2
Refined on Toll for Others	3,745,854	3.7	3.5	3.9	2.4	2.4
DISPOSITION BY THESE REFINERS						
Converted in Plant (consumed in fabricating, etc.)	6,686,209	6.7	5.5	7.5	3.6	4.3
Shipped Out: Own materials	9,952,139	10.0	9.9	10.3	11.3	11.3
Against Tolls	3,808,746	3.8	3.4	3.3	1.9	2.0
TOTAL DISPOSITION	20,447,094	20.4	18.8	21.1	16.8	17.6
TOTAL DISPOSITION Less New Scrap*	19,035,417	19.0	17.6	19.7	16.1	16.8
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)						
	+339,921	+0.3	-0.1	+2.4	+0.8	+0.4
THESE REFINERS' STOCKS AT END OF PERIOD	7,738,101	7.7	7.4	7.7	5.8	5.3

* PRODUCTION From New Scrap is 999 silver made from in-plant clippings, spillage, sweepings, etc., generated during manufacturing processes; since it is in continuous cycle from new scrap to 999 silver, to new scrap, some like to see the production and disposition totals after deducting the new scrap from both.

** Revised

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VOLUME X, NUMBER 10

NOVEMBER, 1980

SILVER JOINS IN SEARCHING FOR LIFE ON MARS

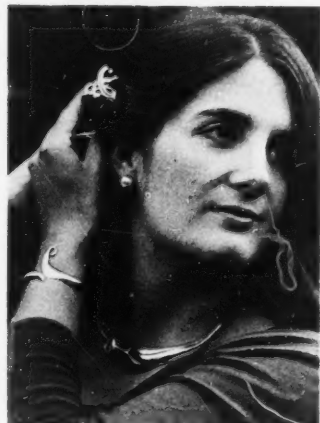
A new alloy containing more than 80% silver developed by Roy I. Batista of **TRW Inc.**, 1 Space Park, Redondo Beach, California has solved the problem of bonding stainless steel to titanium to form the strong, light weight biology experiment equipment (*lower photo*); of the Viking which traveled nearly half a billion miles to land on the planet Mars as pictured in the larger photo.

Conventional brazing and welding processes had not been effective in joining titanium to stainless steel, which have quite different metallurgical characteristics. Titanium, for example, has a very high melting point of over 3000° Fahrenheit, whereas stainless steel typically melts 400° lower. However, these two materials, bonded together, are essential for the performance of the Viking biology experiment instruments which scooped up and meticulously analyzed samples of the planet's surface.

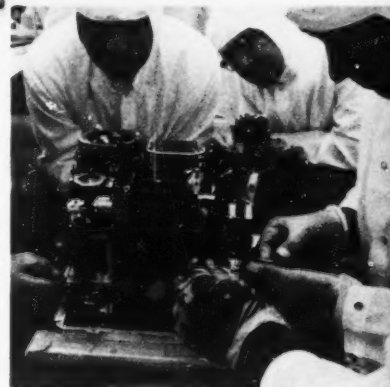
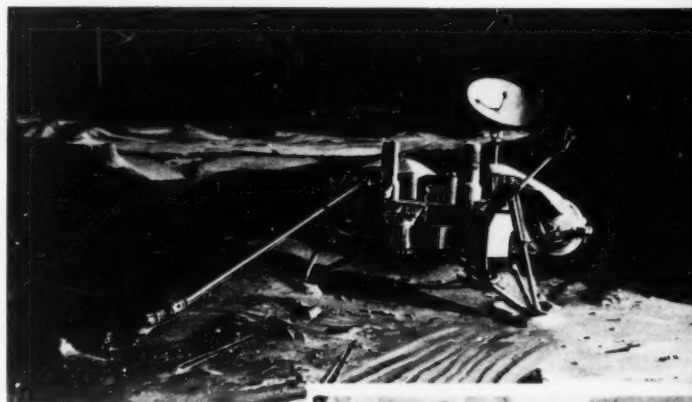
The silver-brazed Viking mini-laboratory made the first chemical report of signs of life on Mars. Whether our kind of life or not, it found a soil so exotic that it chemically mimics life processes on earth—to the great excitement of the world scientific community.

The development of this new silver bonding process is one of 104 advances in silver brazing and soldering which The Silver Institute has summarized in the last seven years for wider use in industry: **last year more than 10 million troy ounces of silver were used for brazing and soldering in the U.S. alone.**

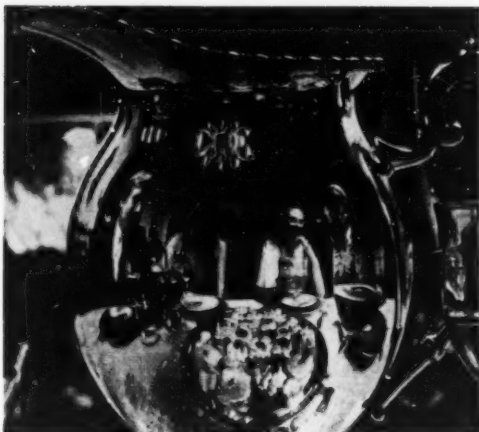
FOR HOLIDAY GIFTS—GIVE STERLING



*Gori & Zucchi jewelry above.
Tane, S.A. jewelry at left.*



Whether it's tableware or something to wear, if it's sterling silver you know it will be a gift that will be appreciated for its beauty, its durability and its continuing intrinsic value. Such a gift might include sumptuous Mexican silver bracelets, necklaces and earrings crafted by **Tane, S.A.** such as those shown at left which are available at Georgetown's **Phoenix** store, 1514 Wisconsin Ave., N.W., Washington, D.C. 20007 at prices ranging from \$10 to \$400. Others will be attracted to fine craftsmanship of the pictured UnoAerre brand of jewelry, or



other jewelry manufactured in Italy by **Gori & Zucchi**, Via Fiorentina 550, 52100 Arezzo, Italy and distributed in the U.S. by **Aurea Jewelry Creations**, 580 Fifth Avenue, New York, N.Y. 10036.

Lovely and charming sterling silver gifts might include tiny charms or Christmas tree decorations, many costing less than \$20, or a four gram 999 fine silver ingot on a silver chain—an interesting conversation piece for less than \$15!

Then there is the unquestioned elegance of beautiful sterling silver flatware, or sterling silver reproductions of museum flatware. To complement sterling silver place settings, a gift of a sterling candelabra by Gorham, or a sterling silver fruit bowl by Paul Revere—costing between

\$150 and \$1,100—would certainly be appreciated by any family.

And this year, **your sterling silver gifts will shine at the next party without having to take the time and trouble of polishing them** if you put a small (two inch by seven inch) slip of paper near your silver in your cabinet, box, drawer, or any other confined area. This paper, called "Silver Protector Strips" by 3M, contains an active ingredient that absorbs the air-borne sulphur that causes tarnish, and will keep your silver from tarnishing for 6 months or more. And it can not harm silver surfaces.

"Silver Protector Strips" may be purchased in packages of 12 strips by sending a check or money order for \$3.99, including postage and handling, to **"3M Silver Protector Strips"**, 3M Mailing Service, P.O. Box 43416, St. Paul, Minnesota 55164. A great idea for a Christmas stocking stuffer!

NEW SILVER TECHNOLOGY REPORTS POWERFUL CATALYTIC EFFECTS OF SILVER

The last issues of **New Silver Technology** summarize several important industrial advances made possible by the use of silver as a catalyst.

- Silvestre Sanchez Torres, 30 Poniente, N° 1512, Interior 2, Puebla, Mexico has been awarded British Patent 1,557,709 on a silver catalytic converter to greatly reduce the emission of harmful pollutants and noise in automotive engine exhaust.

- Carbon monoxide in air is converted to harmless carbon dioxide by contact with silver containing yttrium, developed by the Faculty of Chemistry of the University of Sofia, Bulgaria.

- Improved silver catalysts for making ethylene oxide, the base for billions of pounds of polyesters, have been developed this year by Imperial Chemical Industries Ltd. of London, BASF AG at 6700 Ludwigshafen, and Mitsui Toatsu Chemicals, Inc. of Tokyo.

- Du Pont in Wilmington, Delaware can now make formaldehyde for the production of millions of board feet of plywood with greater efficiency by the use of a new silver-gold catalyst.

- High octane gasoline and synthetic rubber can be made by a silver-catalyzed dehydrogenation process for which Phillips Petroleum of Bartlesville, Oklahoma has been issued U.S. Patent 4,191,846.

- For the production of acrylic type polymers, metallic silver plays a key role in the new process of U.S. Patent 4,180,681 developed by Arco Chemical Co., Glenolden, Pennsylvania.

- Dow Chemical Co., Midland, Michigan has developed an ingenious method for producing porous electrodes in which the tiny pores are uniformly coated with metallic silver. The powerful catalytic effect of the silver surfaces permits their use as efficient air electrodes for fuel cells, but of even greater immediate importance, when they are used as the cathodes of industrial chlorine-caustic soda cells, they produce these industrial products at substantially lower voltage and lower electric power costs.

- For treating industrial effluent gases containing sulfide pollutants, silver is an essential element in a new catalyst developed by Institut Français du Pétrole, Rueil-Malmaison, France and described in U.K. Patent Application 2,025,386-A.

These are examples of 280 detailed summaries of silver developments in 20 categories, presented in the four quarterly issues of 1980. **New Silver Technology** is available from The Silver Institute at the annual price of US\$30 for the four 1981 issues.

UPDATED BOOK ON SILVER INGOT MARKS NOW AVAILABLE



Above are a few of the ingot marks from some of the 77 firms from 20 nations that refine silver to 99.9% purity, which are included in The Silver Institute's updated publication, **SILVER REFINERS OF THE WORLD AND THEIR IDENTIFYING INGOT MARKS**. This unique publication contains the names, addresses and telephone numbers of silver refiners, alphabetically arranged by countries, and by companies, together with the identifying marks of their silver ingots (or bars). The identifying marks are shown in actual size except where a different size is indicated.

Commercial silver ingots contain 99.9% or more pure silver and they usually weigh 1,000 troy ounces or 31 kilograms; however, the exact weight, guaranteed fineness, melt number and ingot number are all stamped on each ingot.

This book also contains detailed specifications of refined silver, including methods of sampling and analysis, as codified by the American Society for Testing and Materials (ASTM). The publication is available from The Silver Institute for US\$5.00.

EMPRESS MARIA THERESA AGAIN SHOWN ON SILVER COIN

Austria recently issued 1,100,000 specimens of 640 fine silver 500 Schilling coins commemorating the 200th anniversary of the death of Empress Maria Theresa of Austria-Hungary, and, in effect, the birth of one of the world's most popular coins—the 1780 Maria Theresa Thaler. Both coins are shown below.

The 1780 Maria Theresa Thaler measures 42.5 mm in diameter and is 83.33 percent pure silver. It has enjoyed global popularity because of its attractive design and consistent silver content. This coin was later struck in mints in Prague, Milan, Florence, Venice, Rome, Leningrad, London, Paris, Brussels, Bombay and other mints in an effort to gain acceptance in trade. And, even to this day, the Maria Theresa Thaler circulates to some degree in the Near East and Africa as an accepted currency.



1980 Maria Theresa coin above.
1780 Maria Theresa Thaler below.



The Maria Theresa Thaler was not the first coin to be called a "thaler". In the early 15th century, the Kings of Bohemia minted a coin called the Joachimsthaler because the most prolific silver mines in Europe were in Joachimsthal in the Kingdom of Bohemia, and it contained eight-tenths of an ounce of silver, as did the "thalers", sometimes called "talers", issued during the following centuries. The American colonies were familiar with the "thaler" and its silver content, and when the colonies achieved independence from England, Alexander Hamilton proposed that the currency of the United States be called the dollar—an obvious corruption of the word "thaler".

The new silver coin, commemorating the death of Maria Theresa and reminding one of silver's historic and respected role as an international store of value through the centuries, can be purchased from **Schoeller & Co. Bank A.G.**, Renngasse 1-3, A-1010 Vienna, Austria. A restrike of the famous silver Maria Theresa Thaler and the 1967 silver 25 Schilling Austrian coin commemorating the 250th anniversary of the birth of Empress Maria Theresa are also available at this bank. An Uncirculated Set of all three coins sells for about US\$80, including postage and insurance.

LATEST SILVER INSTITUTE REFINING STATISTICS

Production and Disposition of **999 Silver Bars** by All Known Refiners in the United States

	TROY OUNCES	MILLION TROY OUNCES				
	October 1980	Oct 1980	Sep 1980	Jan-Oct 1980	Jan-Oct **1979	Full Yr 1979
THESE REFINERS' PRODUCTION, BY SOURCE						
From Primary (ores & concentrates)	1,815,002	1.8	1.9	3.4	4.8	4.8
From Coins	515,649	0.5	1.9	1.7	0.2	0.5
From Old Scrap (used photo film & other products)	5,695,430	5.7	3.7	6.3	5.2	5.2
From New Scrap (in-plant clippings, waste)*	2,576,746	2.6	3.3	2.7	2.0	2.3
TOTAL PRODUCTION	10,602,827	10.6	10.8	14.1	12.2	12.7
TOTAL PRODUCTION Less New Scrap*	8,026,081	8.0	7.5	11.4	10.2	10.4
ABOVE TOTAL PRODUCTION, BY OWNERSHIP						
From Refiners' Own or Purchased Materials	7,508,595	7.5	7.7	9.2	8.8	9.0
Refined on Toll for Others	3,094,232	3.1	3.1	4.9	3.4	3.7
DISPOSITION BY THESE REFINERS						
Converted in Plant (consumed in fabricating, etc.)	4,861,059	4.9	5.0	4.8	3.0	3.1
Shipped Out: Own materials	2,313,734	2.3	3.5	4.6	6.6	7.0
Against Tolls	3,146,580	3.1	3.1	4.7	2.4	2.7
TOTAL DISPOSITION	10,321,373	10.3	11.6	14.2	12.0	12.8
TOTAL DISPOSITION Less New Scrap*	7,744,627	7.7	8.3	11.5	10.0	10.5
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)		TOTAL FOR PERIOD				
	+281,454	+0.3	-0.8	-0.5	+1.7	-1.3
THESE REFINERS' STOCKS AT END OF PERIOD	1,070,492	1.1	0.8	1.1	4.6	1.6

Production and Disposition of **999 Silver Bars** by All Known Refiners in Australia, Canada, Mexico, Peru, South Africa and Sweden; and some other Refiners in Europe and Asia.

	TROY OUNCES	MILLION TROY OUNCES				
	October 1980	Oct 1980	Sep 1980	Jan-Oct 1980	Jan-Oct 1979	Full Yr 1979
THESE REFINERS' PRODUCTION, BY SOURCE						
From Primary (ores & concentrates)	13,095,229	13.1	11.6	12.2	12.8	12.7
From Coins	0	0.0	0.0	0.1	0.0+	0.0+
From Old Scrap (used photo film & other products)	8,909,763	8.9	7.8	7.9	3.5	4.1
From New Scrap (in-plant clippings, waste)*	1,700,134	1.7	1.4	1.5	0.7	0.8
TOTAL PRODUCTION	23,705,126	23.7	20.8	21.6	17.0	17.6
TOTAL PRODUCTION Less New Scrap*	22,004,992	22.0	19.4	20.2	16.3	16.8
ABOVE TOTAL PRODUCTION, BY OWNERSHIP						
From Refiners' Own or Purchased Materials	19,397,247	19.4	17.0	17.7	14.6	15.2
Refined on Toll for Others	4,307,879	4.3	3.7	4.0	2.4	2.4
DISPOSITION BY THESE REFINERS						
Converted in Plant (consumed in fabricating, etc.)	7,584,723	7.6	6.7	7.5	3.8	4.3
Shipped Out: Own materials	10,566,839	10.6	10.0	10.3	11.3	11.3
Against Tolls	4,258,676	4.3	3.8	3.4	1.9	2.0
TOTAL DISPOSITION	22,410,238	22.4	20.4	21.3	17.0	17.6
TOTAL DISPOSITION Less New Scrap*	20,710,104	20.7	19.0	19.8	16.3	16.8
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)		TOTAL FOR PERIOD				
	+1,294,888	+1.3	+0.3	+3.7	+0.2	+0.4
THESE REFINERS' STOCKS AT END OF PERIOD	9,032,989	9.0	7.7	9.0	5.2	5.3

* PRODUCTION From New Scrap is 999 silver made from in-plant clippings, spillage, sweepings, etc., generated during manufacturing processes; since it is in continuous cycle from new scrap to 999 silver, to new scrap, some like to see the production and disposition totals after deducting the new scrap from both.

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VOLUME X, NUMBER II

DECEMBER, 1980

NEW PLUMBING? INSIST ON SILVER-TIN SOLDER



In Norway, when a building contractor plans a new building, he routinely includes the use of silver-tin solder for making capillary joints in the building's plumbing installations. In West Germany, when a man builds his new home, he tells his plumbing contractor to use *only* silver-tin soldering with his copper piping. In Denmark, and in all Scandinavian countries, the Ministries of Housing insist that only one type of soft soldering alloy, namely silver-tin, be used for making joints in copper tubing which carries water in houses and buildings.

Why is there such insistence on the use of silver-tin solder in Germany and Scandinavia? There are several important reasons. But of **primary importance is the fact that silver-tin solder is non-toxic.** In addition, it is easier and quicker to apply (see upper photo), and is much stronger than other common, low temperature solders, according to Niels Gram, Director, **Paul Bergsøe & Søn A/S**, DK-2600 Glostrup, Denmark, a producer of silver-tin solder.



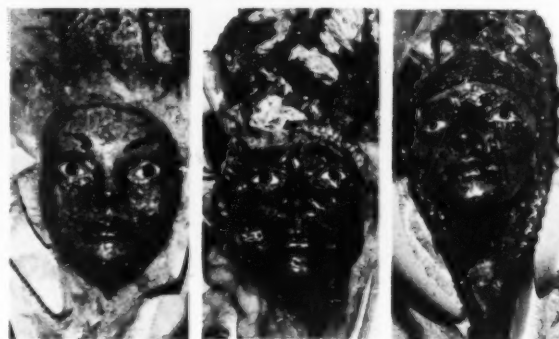
Insofar as cost is concerned, W.T. SanSouci of leading silver-tin solder manufacturer, J.W. Harris Co., 10930 Deerfield Road, Cincinnati, Ohio 45242, notes that in a new home, there might be several thousand dollars worth of fixtures and copper piping and fittings, several hundred dollars worth of plumbing installation labor, and \$20 worth of Harris **Stay-Brite** silver-tin solder (see lower photo) for as many as 100 copper tube and fitting joints. The equivalent amount of lead-tin solder might cost about \$7 less. And mechanics who have used both types of solder report less time required in making the joints with silver-

tin solder, with greater assurance of perfect joints. They point out that only *one* leaky joint can require much more cost in labor than the \$7 difference in solder cost.

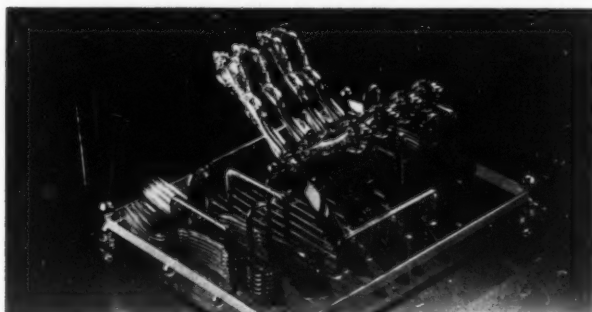
They also say that for some owners and buyers, the assurance of a water system which is made up only of silver, tin, copper and steel, justifies a premium in the value of the house which is *much* greater than the \$7 difference in cost of the solder. In addition to Paul Bergsøe & Søn and J.W. Harris Co., other Silver Institute member firms manufacturing silver-tin soldering include **Federated Metals Corporation**, 150 So. Charles St., Newark, N.J. 07101 and **Engelhard Industries**, Route 152, Plainville, Mass. 02762, **Degussa**, D-6000 Frankfurt 1, Postfach 2644, Frankfurt (Main), West Germany and **DODUCO KG**, D-7530 Pforzheim, Postfach 480, West Germany.

PURE SILVER USED TO RECORD INDIAN ROYALTY OF THE AMERICAS

Sculptor Aurelio Teno of Spain chose the nobility of pure silver to portray the nobility of ancient Indian princesses of seven tribes of South America, Mexico and the United States. Three of the seven heads that were on display at the International Club of Washington, D.C. are shown at right. From left to right are the enameled silver heads of princesses of the Caracas of Venezuela, the Aztecs of Mexico and the Apaches of the American Southwest, each made with over 96 troy ounces of 99.9% pure silver.



NEW BUFFET CADDY FROM ONEIDA SILVERSMITHS



The new and very useful Buffet Caddy, shown at left, has been created by Oneida Ltd. Silver-smiths, Oneida, N.Y. 13421 to help today's hostess conveniently and attractively arrange her sterling silver service on the buffet table, adding elegance and style to casual dining. This Buffet Caddy in silverplate measures 9" x 11" x 2 1/4" and holds up to twelve 5-piece place settings. Both gallery and rack are removable for easy cleaning. The Caddy retails at about \$50.00.

CONTINUED GROWTH OF SILVER INSTITUTE

The Silver Institute welcomes to membership **The Metal Arts Company**, 230 Park Avenue, New York, New York 10017, with its Executive Vice President, Stanley J. Dahle, as its Official Representative in Institute affairs; and **Ames Goldsmith Corporation**, 21 Roger Street, Glen Falls, New York 12801, with Ronald F. Davies, President, as Official Representative. Since June 1980, The Silver Institute has increased its membership from 129 to 141 members.

The Silver Institute has members producing silver and silver products in 25 countries, including Argentina, Australia, Belgium, Bolivia, Brazil, Canada, Chile, Denmark, England, France, Germany, Honduras, India, Italy, Japan, Mexico, Nicaragua, Peru, Philippines, South Africa, Spain, Sweden, Switzerland, and the United States and Zaire.

HOW DID YOU STORE YOUR SILVER COINS?

If you carefully placed your gleaming proof silver coins in PVC (polyvinyl chloride) coin pockets or album pages before putting them in a safe deposit box, the next time you look at your proof silver coins, check for blue-green spots on coin edges or a "frosting" that covers the original mirror finish of proof coins.

Should you find spotting or "frosting" on your proof silver coins, there are ways of removing these results of reactions between coinage silver alloys and PVC. According to chemist Thomas W. Sharpless, Ph.D., "... dipping a spotted coin in acetone, ethyl acetate or other similar organic solvent of moderate polarity is effective for restoration. However, proof coins damaged by frosting in PVC require a somewhat more drastic treatment." Dr. Sharpless has found that "a five to twenty second dip in an acidified solution of thiourea (such as **"Instant-Dip Silver Cleaner"**, Lewal Industries, Inc. 65 Plain Ave., New Rochelle, N.Y. 10801) effectively removes spotting and frosting."

Dr. Sharpless adds, "The coin should be rinsed well with water and then in methanol or distilled water to prevent "water spotting". The utmost caution must be taken to avoid rubbing the proof coin. Blot the coin dry with a clean turkish towel. Rubbing will almost certainly damage the mirror surface of proof coins." He cautions, "I recommend *against* the use of thiourea for other than proof coins."

In his Report, "Corrosion, The Problem of Storage", published in the October 1980 issue of **The Numismatist**, publication of the **American Numismatic Association**, Box 2366, Colorado Springs, Colorado 80901, Dr. Sharpless also suggested that until a more desirable polymer film becomes available, collectors can use containers, made of Dupont's **Mylar** (polyethylene terephthalate), which he says are strong, transparent and safe.

POLAROID'S NEW INSTANT HIGH SPEED ANALYSIS SYSTEM USES SILVER HALIDE FILM

Within a short time after the introduction of Polaroid's new system for instant high speed motion analysis, 25 companies—including Corning Glass Works, GTE Sylvania Corporation, General Electric, Gillette Safety Razor, Co., NASA-Lewis Center and Westinghouse—had purchased the system.

In the past, the turn-around times associated with conventional high-speed photography were simply too long to permit routine use in many industrial applications, so the advantages of

being able to film high speed events in vivid color at up to 300 frames per second, and allow slow motion analysis of the results on the spot only 90 seconds later, are apparent to many scientific and industrial photographers and production supervisors.

The new recording system, according to Maria Wilhelm of **Polaroid Corporation**, 549 Technology Square, Cambridge, MA 02139, includes two Polaroid Polavision Phototape Cassettes: Type 618, which is a professional self developing color motion picture film produced for the system; and Type 617, a higher speed, black and white Phototape designed for use in low ambient light levels. **Both types of films depend on silver halide emulsions to work their magic.**

The new silver halide films are used in the new Mekel 300 Instant Analysis Camera, and processed and viewed in the Polaroid Polavision Analyzer, as pictured. Images are recorded at precisely-selected speeds between four and 300 frames per second, and automatically processed and presented for study, in slow motion or frame-by-frame, or at any of five speeds up to 18 frames per second.

The Polaroid system offers several other advantages. It sells for 75% less than videotape systems, and is portable, self contained and simple to operate. It offers tremendous flexibility in industrial problem solving because it can be used on location by virtually anyone—regardless of prior photographic experience—with minimal training. And the presence of color in high speed motion analysis has proven to be of great utility to scientific and technical researchers, giving scenes and subjects a perception that simply can't be duplicated in black-and-white.



NEW ADVANCES IN PHOTOGRAPHY WITH SILVER

Most of the 26 important improvements in photography reported in the 1980 issues of *New Silver Technology* describe innovations in silver halide systems. Included however are exciting new systems such as the use of arsenious sulfide along with silver nitrate developed by **Zlafop Pri Ban** of Sofia, Bulgaria. When a film of arsenious sulfide is photographically exposed and briefly dipped into a silver nitrate solution, elemental silver is deposited on the unexposed areas leaving the exposed areas clear, thus directly forming a positive image for an ordinary photograph. With longer immersion in a silver nitrate solution, heavy silver deposits can be made in the form of flexible printed circuits for electronic equipment. The system can also be used for making lithographic plates for printing.

Advances in the use of silver along with arsenious sulfide are also being made by Dr. M.S. Chang and colleagues at the **University of Pennsylvania**. They have also applied the system to the making of extremely fine line microcircuits needed in the new generation of computers.

Eastman Kodak in Rochester, New York and **Asahi Chemical Industry Company** of Osaka, Japan can now make improved photographic films containing silver behenate, which require no wet chemical processing, but are quickly developed simply by heating them after photographic exposure.

Edwin H. Land of **Polaroid** has been awarded additional patents on improved "instant development" movie films. Also high speed silver halide color movie films used in photographing news events even with poor lighting, can now be quickly processed in a television studio to provide clear and distinct color televising according to a patent issued to David K. Bullock of **Philip A. Hunt Chemical Corporation** of Palisades Park, New Jersey.

David Kilcast of **Ciba-Geigy AG** of Basle, Switzerland has patented a silver-containing material to produce improved fast-developing microfilm for recording of computer data as sharp black characters on a fully transparent background.

LATEST SILVER INSTITUTE REFINING STATISTICS

Production and Disposition of **999 Silver Bars** by All Known Refiners in the United States

	TROY OUNCES	MILLION TROY OUNCES				
	November 1980	Nov 1980	Oct 1980	Jan-Nov 1980	Jan-Nov **1979	Full Yr 1979
THESE REFINERS' PRODUCTION, BY SOURCE						
From Primary (ores & concentrates)	2,132,066	2.1	1.8	3.3	4.8	4.8
From Coins	63,984	0.1	0.5	1.5	0.3	0.5
From Old Scrap (used photo film & other products)	5,348,309	5.3	5.7	6.2	5.1	5.2
From New Scrap (in-plant clippings, waste)*	3,033,545	3.0	2.6	2.7	2.1	2.3
TOTAL PRODUCTION	10,577,904	10.6	10.6	13.8	12.3	12.7
TOTAL PRODUCTION Less New Scrap*	7,544,359	7.5	8.0	11.1	10.2	10.4
ABOVE TOTAL PRODUCTION, BY OWNERSHIP						
From Refiners' Own or Purchased Materials	7,257,551	7.3	7.5	9.0	8.8	9.0
Refined on Toll for Others	3,320,353	3.3	3.1	4.8	3.5	3.7
DISPOSITION BY THESE REFINERS						
Converted in Plant (consumed in fabricating, etc.)	4,455,604	4.5	4.9	4.8	2.9	3.1
Shipped Out: Own materials	3,197,794	3.2	2.3	4.5	6.7	7.0
Against Tolls	2,752,456	2.8	3.1	4.6	2.5	2.7
TOTAL DISPOSITION	10,405,854	10.4	10.3	13.8	12.1	12.8
TOTAL DISPOSITION Less New Scrap*	7,372,309	7.4	7.7	11.1	10.0	10.5
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)						
	+172,050	+0.2	+0.3	-0.3	+1.9	-1.3
THESE REFINERS' STOCKS AT END OF PERIOD	1,242,542	1.2	1.1	1.2	4.7	1.6

Production and Disposition of **999 Silver Bars** by All Known Refiners in Australia, Canada, Mexico, Peru, South Africa and Sweden; and some other Refiners in Europe and Asia.

	TROY OUNCES	MILLION TROY OUNCES				
	November 1980	Oct 1980	Nov 1980	Jan-Nov 1980	Jan-Nov 1979	Full Yr 1979
THESE REFINERS' PRODUCTION, BY SOURCE						
From Primary (ores & concentrates)	11,419,501	11.4	13.1	12.1	12.7	12.7
From Coins	708	0.0+	0.0	0.1	0.0+	0.0+
From Old Scrap (used photo film & other products)	6,663,617	6.7	8.9	7.8	3.7	4.1
From New Scrap (in-plant clippings, waste)*	1,113,882	1.1	1.7	1.4	0.7	0.8
TOTAL PRODUCTION	19,197,708	19.2	23.7	21.4	17.1	17.6
TOTAL PRODUCTION Less New Scrap*	18,083,826	18.1	22.0	20.0	16.4	16.8
ABOVE TOTAL PRODUCTION, BY OWNERSHIP						
From Refiners' Own or Purchased Materials	15,929,762	15.9	19.4	17.5	14.8	15.2
Refined on Toll for Others	3,267,946	3.3	4.3	3.9	2.3	2.4
DISPOSITION BY THESE REFINERS						
Converted in Plant (consumed in fabricating, etc.)	4,976,444	5.0	7.6	7.3	4.0	4.3
Shipped Out: Own materials	10,863,588	10.9	10.6	10.4	11.1	11.3
Against Tolls	3,118,775	3.1	4.3	3.4	1.8	2.0
TOTAL DISPOSITION	18,958,807	19.0	22.4	21.1	16.9	17.6
TOTAL DISPOSITION Less New Scrap*	17,844,925	17.8	20.7	19.6	16.2	16.8
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)						
	+238,901	+0.2	+1.3	+3.9	+2.0	+0.4
THESE REFINERS' STOCKS AT END OF PERIOD	9,271,890	9.3	9.0	9.3	7.0	5.3

* PRODUCTION From New Scrap is 999 silver made from in-plant clippings, spillage, sweepings, etc., generated during manufacturing processes; since it is in continuous cycle from new scrap to 999 silver, to new scrap, some like to see the production and disposition totals after deducting the new scrap from both.

** Revised

THE SILVER INSTITUTE

A WORLDWIDE ASSOCIATION OF MINERS, REFINERS, FABRICATORS AND MANUFACTURERS
INCORPORATED 1971

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THE SILVER INSTITUTE LETTER

INFORMATION ON SILVER FOR INDUSTRY

VOLUME XI, NUMBER 1

JANUARY, 1981

SHIMMERING SILVER FISHING LURES FOR FRESH AND SALT WATER FISHING



Chicago Chinook fish, above, caught in Lake Michigan with silver "Champ" lure, below.



The gleaming silver lure, shown below left, is called "Mr. Champ" by its manufacturer, the **Weber Tackle Company**, Stevens Point, Wisconsin 54482, and is one of more than 50 silver plated lures of different styles and weights.

The $\frac{1}{12}$ to $\frac{1}{4}$ ounce silver Mr. Champ lures fill the needs of the ultra-light angler, and according to Weber, it is a superb lure for white bass, perch and trout. The $\frac{1}{3}$ through $\frac{7}{8}$ oz. Champs are good all-round sizes for general fresh water fishing, with the $\frac{7}{8}$ oz. size being particularly popular in the Great Lakes because of the great casting distances and depths this lure will achieve. Silver plated 1 to 4 oz. Champs are designed primarily for salt water fishermen.

Silver is used for fishing lures, as well as for mirrors, and solar energy systems, because it is the best reflecting material. Silver's reflectance of light is 30% greater than aluminum, 33% greater than copper, 48% greater than nickel and 72% greater than chromium!

Fishing lures are only a few of the millions of products which are improved by plating with pure silver. Just in the last seven years, 97 new advances have been made in improved silver plating throughout industry as summarized in the Silver Institute's quarterly publication, **NEW SILVER TECHNOLOGY**. Among the most recent developments are: a new way to plate pure silver onto inert plastic materials which was developed by Lawrence M. Schiavone of Bell Telephone Laboratories, Inc., 600 Mountain Avenue, Murray Hill, New Jersey 07974; a silver electroplate, containing tin, which is unusually resistant to corrosion and tarnish

and has excellent soldering properties, which was developed by Wladyslaw Reksc of the Podtswowej Chemical Politechnical Institute of Posnan, Poland; and improved transistors now made possible by a new silver plating developed by Kiyomitsu Oi of Mitani Shindo Co., 1 Kitahanana-Cho Kamitoba, Minami-Ku Kyoto 601, Japan.

In the United States alone, more than 8 million troy ounces of silver per year have been used in making silver plated products.

BON DEL WATER FILTERS USE SILVER AS BACTERIOSTATIC AGENT

Behind the dramatic success of one of the world's most popular bacteriostatic water filter products are Mr. and Mrs. Ray Ward, 10,000 distributors—and silver. Before creating **Bon Del, Inc.**, P.O. Box 1461, Mesa, Arizona 85201 in 1977, Ray Ward studied the use of silver as a purifier, starting with findings dating back to the days of the Roman Empire and moving on to silver's proven efficacy as a bactericide in today's biomedical applications. Adding to this knowledge, Mr. Ward carried out his own research and development program, which led him to build a water filter unit using as a filtering bed, activated carbon with silver bonded to it as a bacteriostatic agent.

First produced in the kitchen of the Ward home, the Bon Del Countertop unit which sits on the counter next to the sink and is quickly attached to the faucet with a diverter valve, a tourister portable unit, and a refrigerator unit which attaches in-line for use on drinking fountains, refrigerator ice makers and water dispensers, are all now manufactured in modern plants in Mesa, Arizona and in Victoria, British Columbia, Canada. Mr. Ward calls silver "the most consistent bacteriostatic agent", and adds that it inhibits the growth of bacteria within the unit when water is allowed to stand over-

night or over longer periods of time. To accomplish this, the Bon Del filtering bed contains 1.05% pure metallic silver.

Mr. Ward noted, "The granular activated carbon within the unit removes the objectionable tastes and odors found in our drinking water systems where chemicals and chlorine have been added. Along with silver and carbon, we have included within our unit a pair of 5 micron filter discs which aid in the removal of particulate matter before it gets to the filter bed. We also have a patented micron scrubber action which increases the life of the micron filter discs."

In February, 1980, the company received Environmental Protection Agency (E.P.A.) registration numbers on the units being manufactured and sold by Bon Del. And in Canada, the Bon Del Water Filter was recently tested by Health and Welfare of Canada, according to Mr. Ward, and was found to be the "most consistent bacteriostatic water filter that they have ever tested", and was recommended for use on Canadian Coast Guard lighthouses. The Bon Del Water Filter is also being used by the Finnish Army and in hospitals in Finland. These silver-assisted filters are now being increasingly purchased by people who like good-tasting, clean, good-smelling, clear, drinking water in other European nations, 10 South American countries, 2 in Central America, the Philippines and Singapore, as well as in Canada and the United States.

NEW MEMBER WELCOMED

The Silver Institute warmly welcomes to membership, **Asamera Inc.**, c/o **Minera San Pedro Analco, S.A. de C.V.**, 1730 Av. Libertad, Sector Juárez, Guadalajara, México, with its Vice President Mining, Ralf M. Kleine, as its Official Representative in Institute affairs.

ELEGANT SILVER SETS OFF LUXURIOUS PALACE

Noted for its artistry, craftsmanship and quality, Reed & Barton's silver was chosen by famous New York developer, Harry B. Helmsley, to add one final touch of elegance to his uniquely luxurious hotel, **The Palace**, located at 455 Madison Avenue in New York City.

Within the imposing combination of a 560 foot glass tower and the cluster of Italianate brown-stone mansions that form this recently inaugurated 1,100 bedroom hotel, Reed & Barton's King pattern of heavy silver plated flatware serves diners in the Trianon—the main dining room—and in the luxurious Gold Room where afternoon tea is served with Reed & Barton's finest gracefully regal holloware, plated with pure silver and decorated with a crown and the words "The Palace" etched underneath.

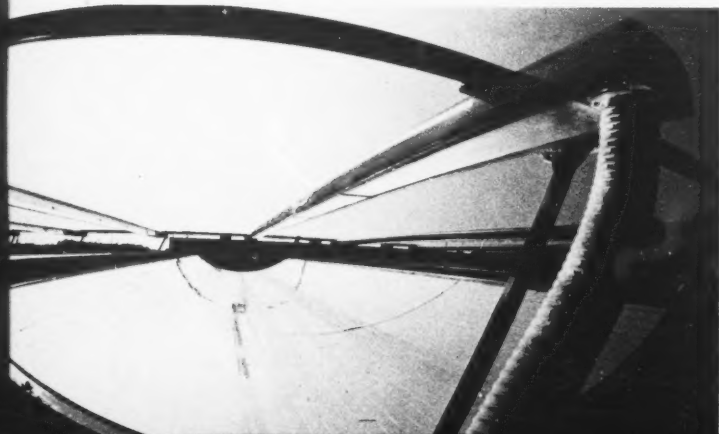
And when dining in the soft glow of candle light, the candles are placed in one of the 100 heavily silver plated, ornate candelabras from Reed & Barton. Additional super-sized candelabras were also commissioned by The Palace and are being crafted by **Reed & Barton Corporation**, 144 Britannia Street, Taunton, Massachusetts 02780.

SILVER'S IMPORTANT ROLE IN DISNEY WORLD'S SOLAR ENERGY SYSTEM

Silver-backed mirrors are helping **Walt Disney World**, P.O. Box 40, Lake Buena Vista, Florida 32830 to accomplish the seemingly impossible—the use of the hot Florida sun to produce enough cold air to air-condition a two-story office building.

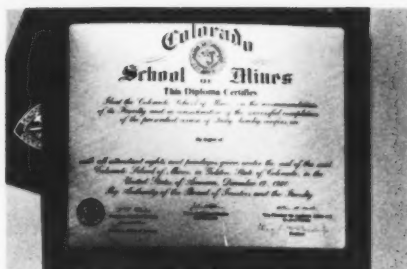
With silvered solar reflectors forming the roof (pictured at left) of Disney World subsidiary, **Reedy Creek Utilities Co.**, the building's solar energy system generates enough hot water—by multiplying the intensity of the sun by eight times as its rays are concentrated onto water filled collector bars—to provide from 80 to 85% of the air-conditioning needs for the year and *all* the heat and hot water needed.

Silver has also been used by the producer of Disney's solar energy system, **AAI Corporation**, P.O. Box 6767, Baltimore, Maryland 21204, a subsidiary of **United Industrial Corp.**, to create other similarly effective systems for, among others, two Maryland Schools and a concrete block factory in Pennsylvania.



SILVER TRADITION PRESERVED

When it appeared that the **Colorado School of Mines** might have to abandon the awarding of silver diplomas, the tradition was preserved by **ASARCO Incorporated**, 120 Broadway, New York, N.Y. 10271, the country's largest refiner of silver. Professional and graduate degree students had received sterling silver diplomas, like the diploma pictured at left, since 1934. The diplomas measure 5½ by 4⅞ inches by ⅛ inch thick.



After ASARCO arranged with the school's board of trustees to provide or pay for the silver used to produce the diplomas, Ralph L. Hennebach, President of ASARCO, INC. and member of the Colorado School of Mines Class of '41 and recipient of a treasured silver diploma, commented, "It is entirely appropriate that the graduates of the nation's foremost mineral engineering school get a special, lasting symbol of the

achievement. It might be more pragmatic to donate money to the mining and metallurgy departments, but I just think that the silver diploma is an important distinctive symbol of a fine accomplishment."

MANY BEAUTIFUL AND ARTISTIC SILVER COINS ISSUED IN 1980

Silver coins were struck to celebrate Hanukka and—for the first time, Christmas—in 1980. Minted by the **Royal Canadian Mint**, the year's Israeli coin marking the celebration of Hanukka, the Festival of Lights, is in 850 fine silver, measures 30 millimeters in diameter and weighs 14.4 grams. This coin features a lamp from the Greek island of Corfu, honoring the island's Jewish community that perished during the Nazi Holocaust, and has a face value of 1 Shekel.

While the Hanukka coin is already a tradition in Israel, **the first silver coin to be issued specifically for the Christmas Season** and to refer to this both in the design and description is the Christmas Coin, *pictured below*, issued by the Isle of Man in 1980. This sterling silver coin, weighing 15.50 grams, has a face value of 50 Pence and features an artist's impression of a Dickensian Coach and Horses and the arrival of the paddle steamer, "Mona's Isle" from Liverpool with the Christmas Mail in December 1830. This Christmas coin was struck by the **Pobjoy Mint**, Mint House Oldfields Road, Sutton, Surrey, England.

After four years of research, **Valcambi S.A. of Switzerland** minted 10,000 collections of ten coins of the Cayman Islands, honoring the **37 Kings of England**. Each coin has a face value of \$25, has a diameter of 42 millimeters, weighs 560 grains and is of 500 fine silver. The coin *pictured below* shows four Kings of the House of Windsor—Edward VII, 1901–1910, George V, 1910–1936, Edward VIII, January–December 1936 and King George VI, 1936–1952—while other coins in the series show from two to four kings, including the Anglo-Saxon kings Edward the Confessor and Harold II (dating back to 1042) and on through history's pageant of Royal Houses. Additional information may be obtained from Mr. Doug Galusha, Paramount International Coin Corporation, one Paramount Plaza, Englewood, Ohio 45322.

Other beautiful silver coins were issued in 1980 by Bolivia, which commemorated the International Year of the Child by minting a 200-boliviano coin depicting a person playing a guitar-like musical instrument and two children dancing; Hungary which issued silver coins to honor its own silver medal winners in the Ice Dancing competition at the 1980 Lake Placid Winter Olympic Games; and by many other countries ranging in size from the vast area of the Soviet Union to the tiny mountaintop state of San Marino which issued a 500 Lire coin to celebrate the XXII Olympic Games in Moscow and a 1000 Lire .835 silver coin honoring St. Benedict of Norcia.



LATEST SILVER INSTITUTE REFINING STATISTICS

Production and Disposition of 999 Silver Bars by All Known Refiners in the United States

	TROY OUNCES		MILLION TR. OZ.	
	December 1980	Full Year 1980	1980	**1979
THESE REFINERS' PRODUCTION, BY SOURCE				
From Primary (ores & concentrates)	4,042,426	40,476,112	3.4	4.8
From Coins	682,706	17,399,257	1.4	0.4
From Old Scrap (used photo film & other products)	6,220,822	74,849,296	6.2	5.1
From New Scrap (in-plant clippings, waste)*	3,607,192	33,601,718	2.8	2.3
TOTAL PRODUCTION	14,553,146	166,326,383	13.9	12.6
TOTAL PRODUCTION Less New Scrap*	10,945,954	132,724,665	11.1	10.3
ABOVE TOTAL PRODUCTION, BY OWNERSHIP				
From Refiners' Own or Purchased Materials	10,656,072	109,944,155	9.2	8.9
Refined on Toll for Others	3,897,074	56,382,228	4.7	3.7
DISPOSITION BY THESE REFINERS				
Converted in Plant (consumed in fabricating, etc.)	5,814,082	58,635,093	4.9	3.1
Shipped Out: Own materials	5,125,578	54,175,379	4.5	6.9
Against Tolls	3,754,003	53,983,574	4.5	2.7
TOTAL DISPOSITION	14,693,663	166,794,046	13.9	12.7
TOTAL DISPOSITION Less New Scrap*	11,086,471	133,192,328	11.1	10.4
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)				
	- 140,517	- 467,663	- 0.5	- 1.3
THESE REFINERS' STOCKS AT END OF PERIOD	1,102,025	1,102,025	1.1	1.5

Production and Disposition of 999 Silver Bars by All Known Refiners in Australia, Canada, Mexico, Peru, South Africa and Sweden; and some other Refiners in Europe and Asia.

	TROY OUNCES		MILLION TR. OZ.	
	December 1980	Full Year 1980	1980	1979
THESE REFINERS' PRODUCTION, BY SOURCE				
From Primary (ores & concentrates)	10,648,459	143,937,820	12.0	12.7
From Coins	193,566	864,500	0.1	0.0+
From Old Scrap (used photo film & other products)	6,329,797	92,071,562	7.7	4.1
From New Scrap (in-plant clippings, waste)*	1,427,089	17,251,030	1.4	0.8
TOTAL PRODUCTION	18,598,911	254,124,912	21.2	17.6
TOTAL PRODUCTION Less New Scrap*	17,171,822	236,873,882	19.7	16.8
ABOVE TOTAL PRODUCTION, BY OWNERSHIP				
From Refiners' Own or Purchased Materials	15,031,092	207,551,924	17.3	15.2
Refined on Toll for Others	3,567,819	46,572,988	3.9	2.4
DISPOSITION BY THESE REFINERS				
Converted in Plant (consumed in fabricating, etc.)	5,564,434	85,627,877	7.1	4.3
Shipped Out: Own materials	11,133,896	125,151,536	10.4	11.3
Against Tolls	3,540,450	41,041,393	3.4	2.0
TOTAL DISPOSITION	20,238,780	251,820,806	21.0	17.6
TOTAL DISPOSITION Less New Scrap*	18,811,691	234,569,776	19.5	16.8
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)				
	- 1,639,869	+ 2,304,106	+ 2.3	+ 0.4
THESE REFINERS' STOCKS AT END OF PERIOD	7,632,021	7,632,021	7.6	5.3

* PRODUCTION From New Scrap is 999 silver made from in-plant clippings, spillage, sweepings, etc., generated during manufacturing processes; since it is in continuous cycle from new scrap to 999 silver, to new scrap, some like to see the production and disposition totals after deducting the new scrap from both.

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THE SILVER INSTITUTE

A WORLDWIDE ASSOCIATION OF MINERS, REFINERS, FABRICATORS AND MANUFACTURERS
INCORPORATED 1971

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THE SILVER INSTITUTE LETTER

INFORMATION ON SILVER FOR INDUSTRY

VOLUME XI, NUMBER 2

FEBRUARY, 1981

NEW MOTION PICTURE "SILVER" PRESENTED BY THE SILVER INSTITUTE

The exciting new version of the color sound film "Silver" was seen for the first time at the Board Meeting of The Silver Institute, held in Washington, D.C. on February 2nd. This film, which gives the viewer a unique opportunity to accompany silver from its ancient veins deep within the earth, through its complicated processing and on to its many, many beneficial uses, was paid for by the members of the Silver Institute which will give 300 prints to the Bureau of Mines for circulation on a free-loan basis to educational institutions, civic and business groups, scientific and professional societies and other responsible organizations.



Attending the Silver Institute Board Meeting in Washington, D.C. are (l. to r.) Institute Chairman, Charles D. Snead, Jr. of Callahan Mining Corp., Institute Vice President Harry M. Conger of Homestake Mining Co., Paul Henshaw of Homestake Mining Co., William A. Griffith of Hecla Mining Co., W.C. Cole of Earth Resources Co., Justin L. Rice of Coeur d'Alene Mines Corp. and Robert Valentino of AMAX Lead and Zinc, Inc.

Watching the miners—using the most modern of safety and mining equipment—working a mile below the earth's surface and hearing the words, "They know the beauty of the metal they mine . . . and of its vital role in the modern world," and "Today, silver is harder to find . . . costlier to mine." sets the mood for this industrial adventure . . . Animated drawings of an underground lead-silver mine . . . Dramatic pictures of the labors of crushers, flotation cells, concentrate drying and an open-pit mine. More drawings explain the smelting procedure. Impressionistic film of pouring silver, silver ingots, silver foil and silver wire accompany descriptive words to a background of music and industrial sounds. Then the beauty of the silversmith and the words, "Grace . . . Purity . . . Elegance . . . Silver . . . Incomparable silver . . ." Batteries, mirrors, better water, polyester fabrics, automobile starters, X-ray film, motion pictures such as "Silver", still photography, solar energy—so many wonderful products from silver that the viewer is not surprised when the narrator says, "From the moment we rise to the time we go to bed, we use silver alloys throughout the whole wide world of modern day life . . ."

Because of the international character of both the precious metal, silver, and The Silver Institute's membership, the "Silver" motion picture will be available in the future with Spanish, German, French and Japanese soundtracks, in addition to the original English language version. When a portion of the Spanish language version was shown, Carlos Loret de Mola of Compañía Minera Huampar, S.A. of Peru enthusiastically commented, "Unico en su genero! Este excelente film revela los procesos de producción y los multiples usos de la plata . . .", and a view of the German version sparked this comment by John W. Eschenlohr of Degussa of West Germany, "Dieser interessante film zeigt in leicht verstandlicher form die Forderung, das Scheiden und die mannigfaltigen Anwendungen von Silber im Alltag."

In April, in the U.S., requests for the loan of English version prints of "Silver" should be addressed to Motion Pictures, Bureau of Mines, U.S. Department of Interior, 4800 Forbes Avenue, Pittsburgh, Pennsylvania 15213. Information regarding the availability of "Silver" through Silver Institute members in other countries will be announced at a later date.

Below (l. to r.): Ricardo Rojo of Industrias Peñoles, S.A., Institute Chairman Emeritus, Simon D. Strauss of ASARCO, Inc., Carlos Loret de Mola of Cia. Minera Huampar, S.A. and Robert M. Reininger of Rosario Resources discuss the Spanish language version of the motion picture "Silver".



SILVER INSTITUTE BEGINS SECOND DECADE OF SERVICE

Silver Institute Chairman, Charles D. Snead, Jr. of Callahan Mining Corporation, reminded Institute officers and directors attending the February meeting of the Institute's Board of Directors in Washington, D.C., that ten years ago, ten firms demonstrated their faith in the future of the silver industry by creating The Silver Institute which, today, has over 145 corporate members. Mr. Snead noted that just in the past year, the Institute's membership has grown more than 10%, and expressed the confidence that the Institute's service will continue its healthy growth in the next decade. Founding members of The Silver Institute are: AMAX, ASARCO Inc., Anaconda Co., Callahan Mining Corp., Cerro Mines (Centromin Peru), Day Mines, Inc., Hecla Mining Co., Rosario Resources, Sunshine Mining Co. and The Bunker Hill Co.

Following a financial report by Institute Treasurer, William P. Lohden, the Chairman of the Nominating committee and past-President of the Institute, Robert M. Reininger, expressed the Institute's appreciation for "the great contributions to the work of The Silver Institute" made by Henry L. Day of Day Mines, Inc., David J. Wagnon of Sunshine Mining Co., and Ian G. Gould of North Broken Hill Ltd., who, because of change of duties, have resigned from the Board of Directors. Nominated and elected to fill these vacancies were William M. Calhoun of Day Mines, Inc., G. Michael Boswell of Sunshine Mining Co., and Peter C. Barnett of North Broken Hill Ltd. Mr. Barnett was also elected to serve as Vice President of the Silver Institute for Australia and Asia, completing the term of Ian G. Gould.

Institute Executive Director, Richard L. Davies, described some of the current activities of the Institute and presented the premiere showing of the updated film "Silver" to the Board of Directors.



Left to right: Institute Treasurer William P. Lohden of Callahan Mining Corp., A.C. Haskell of Hilemn Laboratories, Sohier D. Marks of Mocatta Metals and Frank G. Woodruff of Gulf Resources and Chemical Co.



At left: Institute Executive Director, Richard L. Davies, shows "Silver" to the Institute's officers and board members. Above, left: the German language version of the film "Silver" is discussed by (l. to r.) Felix Freeman of J. Aron & Co., John W. Eschenlohr of Degussa and Alex Schmidt-Fellner of AMAX Inc. Above, right: Attending the Board Meeting from the United Kingdom are (l. to r.) Michael Hughes of Texasgulf, London, Willem Beunderman of Consolidated Gold Fields Ltd. and Robert Mansell of Engelhard Industries. Below, left (l. to r.): Institute Vice President-Canada, A.M.B. Hart of Johnson Matthey Ltd., J.A.K. McPhail of Inco Metals Co., J.A. Butterfield of Equity Silver Mines and Kent D. Hoffman of Texasgulf, Inc. Below, right (l. to r.): Institute Vice President Bob Ross of Engelhard Industries, Art Mrozek of Sabin Metals Corp., John H. Boyd of Kennecott Sales Corp., Peter Hamilton of Royal Apex Silver, Inc. and James C. Buck of ASARCO, Inc.

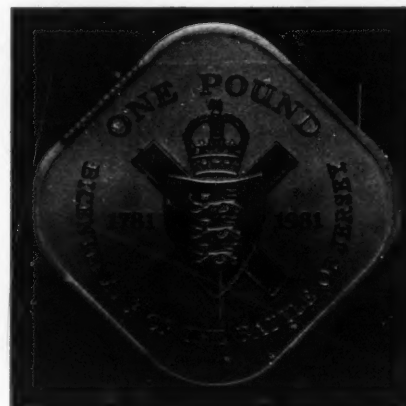


THREE NEW MEMBERS FROM THREE DIFFERENT NATIONS

The Silver Institute warmly welcomes to membership the following three companies: **Australian Silver Reclamation Pty. Ltd.**, 30 Cross Street, P.O. Box 504, Brookvale 2100, New South Wales, Australia, with its Export Sales Manager, Paul P. Servais, as its Official Representative in Institute affairs; **Compañía Minera de Caylloma, S.A.**, Avenida Jorge Basadre (antes Av. Orrantia) # 410, San Isidro, Lima, 27 Perú, represented in Institute affairs by its Managing Director, Andrés Bravo Bresani; and **Luxmi Traders**, 2, India Exchange Place, Calcutta-700 001, India, with S.G. Daga as its representative in Institute matters. The Silver Institute has members producing silver and silver products in 25 countries.

INTERESTING STERLING SILVER ONE POUND COIN ISSUED BY JERSEY

Jersey has a population of approximately 80,000 and is the largest of the Channel Islands, covering an area of 45 square miles. It lies only a few miles from the northwest coast of France and about 100 miles from England. Because of its proximity to France, the history of Jersey includes many French attacks on it. The last of such attacks culminated in the **Battle of Jersey in 1781**—an event commemorated two hundred years later by the minting of Jersey's new One Pound coin, *shown at right*. Ten thousand sterling silver proof One Pound Coins, measuring 25.4 mm in diameter (from corner to corner) and weighing 10.45 grams, were minted by the Royal Mint. The coin's pictured design shows the badge of the Royal Jersey Militia which—together with Garrison forces—defeated a French attack force under the command of Baron de Rullecour on January 6, 1781. Additional information about this coin may be obtained from the Royal Mint Numismatic Bureau, P.O. Box 6, Llantrisant, Pontyclun, Mid-Glamorgan, CF7 8YT Great Britain or, in the U.S., from the **British Royal Mint**, 128 Passaic Avenue, Fairfield, N.J. 07006.



NEW SILVER DEVELOPMENTS

The January 1981 issue of *New Silver Technology* describes 70 new silver developments from 13 countries. Among these are the following:

- Improved solid electrolyte batteries which operate effectively at extremes of temperature have been produced:
 - Forschungsinstitut Berghof GmbH of Tübingen, Germany and Instituto de Quimica-Fisica of Madrid, Spain use silver rubidium iodide.
 - Solid State Physics Laboratories of Al Fateh University in Tripoli, Libya make the batteries with silver iodide orthophosphate.
 - Capitol Industries of Montreal, Quebec and Sprague Electric Co. of North Adams, Massachusetts developed silver iodide pyrophosphate for these new batteries.
- Silver-hydrogen storage batteries with maximum power and minimum weight are now made by EIC Corporation of Newton, Massachusetts.
- PPG Industries, Inc. of Pittsburgh, Pennsylvania uses thin transparent layers of silver along with titanium oxide for electrically heated windows to remove frost and ice for automobiles and aircraft.
- Improved contact material for telephone equipment, made with 98.1% silver and 1.9% silicon, has been developed by Ibaraki Electrical Communications Laboratory and Nippon Telegraph and Telephone Public Corporation in Tokyo, Japan.
- Bendix Corporation in Kansas City, Missouri tested 29 kinds of solder and found that two solders made with silver and tin surpassed all the others in resisting cracking under thermal stresses.
- A new electrolytic cell for continuous production of refined silver and refined gold has been developed by Chimet S.p.A. of Arezzo, Italy.

LATEST SILVER INSTITUTE REFINING STATISTICS

Production and Disposition of **999 Silver Bars** by All Known Refiners in the United States

	TROY OUNCES		MILLION TROY OUNCES			
	January 1981	Jan 1981	Dec 1980	Jan 1980	Full Yr 1980	Full Yr 1979
THESE REFINERS' PRODUCTION, BY SOURCE						
From Primary (ores & concentrates)	3,601,102	3.6	4.0	5.6	3.4	4.8
From Coins	345,627	0.3	0.7	3.8	1.4	0.4
From Old Scrap (used photo film & other products)	6,121,985	6.1	6.2	6.6	6.2	5.1
From New Scrap (in-plant clippings, waste)*	2,820,324	2.8	3.6	2.0	2.8	2.3
TOTAL PRODUCTION	12,889,038	12.9	14.6	18.1	13.9	12.6
TOTAL PRODUCTION Less New Scrap*	10,068,714	10.1	10.9	16.0	11.1	10.3
ABOVE TOTAL PRODUCTION, BY OWNERSHIP						
From Refiners' Own or Purchased Materials	9,144,142	9.1	10.7	11.9	9.2	8.9
Refined on Toll for Others	3,744,896	3.7	3.9	6.2	4.7	3.7
DISPOSITION BY THESE REFINERS						
Converted in Plant (consumed in fabricating, etc.)	4,518,082	4.5	5.8	5.1	4.9	3.1
Shipped Out: Own materials	4,208,847	4.2	5.1	4.9	4.5	6.9
Against Tolls	3,620,121	3.6	3.8	6.4	4.5	2.7
TOTAL DISPOSITION	12,347,050	12.3	14.7	16.3	13.9	12.7
TOTAL DISPOSITION Less New Scrap*	9,526,726	9.5	11.1	14.3	11.1	10.4
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)			TOTAL FOR PERIOD			
			+541,988	+0.5	-0.1	+1.8
THESE REFINERS' STOCKS AT END OF PERIOD			1,644,013	1.6	1.1	3.3
					1.1	1.5

Production and Disposition of **999 Silver Bars** by All Known Refiners in Australia, Canada, Mexico, Peru, South Africa and Sweden; and some other Refiners in Europe and Asia.

	TROY OUNCES		MILLION TROY OUNCES			
	January 1981	Jan 1981	Dec 1980	Jan 1980	Full Yr 1980	Full Yr 1979
THESE REFINERS' PRODUCTION, BY SOURCE						
From Primary (ores & concentrates)	11,690,154	11.7	10.6	13.5	12.0	12.7
From Coins	305,748	0.3	0.2	0.1	0.1	0.0+
From Old Scrap (used photo film & other products)	6,082,534	6.1	6.3	7.7	7.7	4.1
From New Scrap (in-plant clippings, waste)*	1,343,246	1.3	1.4	1.5	1.4	0.8
TOTAL PRODUCTION	19,421,682	19.4	18.6	22.8	21.2	17.6
TOTAL PRODUCTION Less New Scrap*	18,078,436	18.1	17.2	21.2	19.7	16.8
ABOVE TOTAL PRODUCTION, BY OWNERSHIP						
From Refiners' Own or Purchased Materials	16,521,704	16.5	15.0	18.7	17.3	15.2
Refined on Toll for Others	2,899,978	2.9	3.6	4.1	3.9	2.4
DISPOSITION BY THESE REFINERS						
Converted in Plant (consumed in fabricating, etc.)	5,925,287	5.9	5.6	8.4	7.1	4.3
Shipped Out: Own materials	10,895,121	10.9	11.1	11.6	10.4	11.3
Against Tolls	2,665,709	2.7	3.5	2.9	3.4	2.0
TOTAL DISPOSITION	19,486,117	19.5	20.2	23.0	21.0	17.6
TOTAL DISPOSITION Less New Scrap*	18,142,871	18.1	18.8	21.5	19.5	16.8
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)			TOTAL FOR PERIOD			
			-64,435	-0.1	-1.6	-0.2
THESE REFINERS' STOCKS AT END OF PERIOD			7,567,586	7.6	7.6	5.1
					7.6	5.3

* PRODUCTION From New Scrap is 999 silver made from in-plant clippings, spillage, sweepings, etc., generated during manufacturing processes; since it is in continuous cycle from new scrap to 999 silver, to new scrap, some like to see the production and disposition totals after deducting the new scrap from both.

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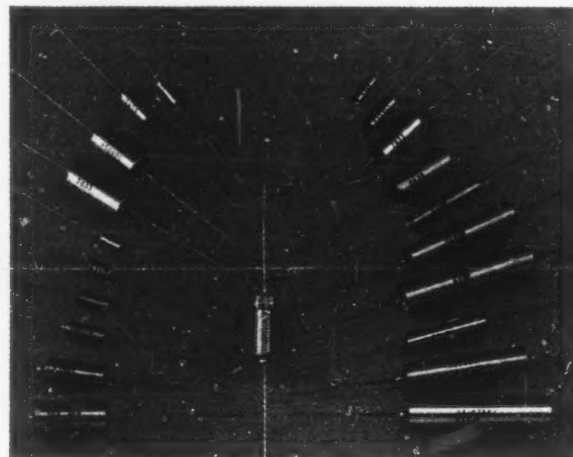
MARCH 1981

NEW SHAPES AND CONCEPTS OF SILVER'S CONDUCTIVITY

"Because of its superior conductive qualities, large quantities of silver have long been used in the manufacture of capacitors, resistors and other electronic components. Initially silver was used in metallic form, either as a solid can or as a solid plate, but," according to Mr. A.M.B. Hart, President of **Johnson Matthey Ltd.**, 110 Industry Street, Toronto, Canada M6M 4M1 and Vice President for Canada of The Silver Institute, "the need to reduce the cost and the size of these components, so that many times more of them would be used, meant that our firm had to develop products through which silver could be accurately deposited onto very small areas."

"As a result, our Johnson Matthey affiliates in Great Britain and the United States developed products called '**conducting plastics**'—**pure silver with resins**—which we sell throughout the world. They are manufactured in the form of paints or adhesives which, when applied to a surface or joint, will permit electrons to flow through the metallic particles and thus conduct electricity. As a result, a new concept of creating conductive surfaces has come from the new methods of applying silver's conductive qualities to any surface. Conductivity can now be applied by spraying, brushing, dipping, screen-printing, or even by using a knife or spatula. Similarly, soldering was a traditional technique used for forming metal to metal conductive bonds; now silver conductive adhesives are increasingly used by both industry and the handyman as a new way of 'cold soldering'." said Mr. Hart.

As Mr. Chris Proctor of **Johnson Matthey Chemicals Ltd.**, Orchard Road, Royston, Hertfordshire S68 5HE England, recently commented, "If you had to attach an electrode to a piece of glass, it would be a very brave man who would take out a hot soldering iron and try to achieve this. With silver conductive adhesives, it is now so simple that it can be done at room temperature by the ordinary person, often in his own house. This is where the major breakthrough has taken place. Instead of supplying conductive resins only to highly specialized, highly technical industries, they are now available for the handyman. No special training or equipment is required. If you can use a paint brush or mix two components together with a palette knife or spatula, then you can make conductive surfaces or conductive joints with silver plastic."



Tantalum capacitors are dipped in silver "paint" because of silver's superior conductive qualities.

SILVER CIRCUITS FOR EGGS, JEWELERS AND . . . INDUSTRY

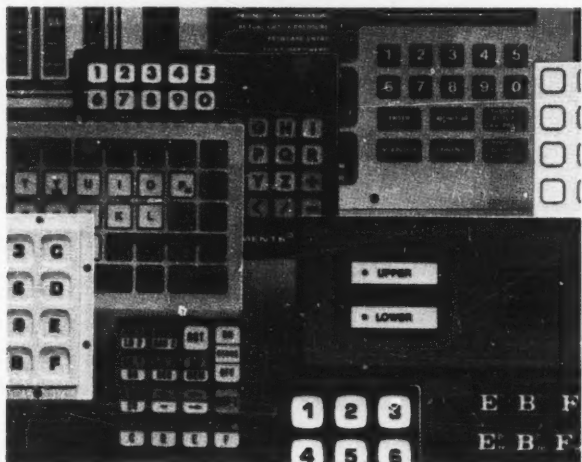
The Agricultural Research Council in Great Britain wanted to determine the length of time of incubation of "lots of eggs", and asked Johnson Matthey if it could help. According to Chris Proctor of Johnson Matthey Chemicals Ltd., "The answer was simple. Paint two small circuits with silver resin onto each egg shell and connect these up to timers using silver adhesive to bond the electrodes. As soon as the chick breaks the egg the circuit is broken and it records the exact time. Just imagine how difficult it would have been to do all this with solid metal. The difference is that with a silver resin you can put down the thinnest of films so that the egg itself is not damaged, or interfered with."

Mr. Proctor noted that by painting silver lines around the edge of the glass of a refrigerated food display case, if the glass panel should be broken, the silver painted track—connected to an emergency cut-off switch—would also be broken and would render harmless any exposed and potentially dangerous electrical circuitry. He added, "Of course, the obvious application here is for jewelers and banks. Sometimes you may notice that their windows have a similar alarm system using, for example, a conductive tape bonded onto the glass. This can cause problems because it is possible for the glass to break out but for the conductive tape to remain unbroken. This problem does not occur with a silver paint because it is in intimate contact with the glass."

But, for industry? Mr. Ron Selwood of **Johnson Matthey, Inc.**, Metallizing Preparations, 456 Devon Park Drive, Wayne, Pennsylvania 19087, noted that his company has supplied the tantalum capacitor industry's **Sprague Electric Company** of North Adams, Massachusetts, the **Kemet Division of Union Carbide** in Greenville, South Carolina and others with over 500,000 ounces of Counter Electrode silver "paint" which is applied to capacitors through a dipping process. And other silver conductive plastics are being used by the resistor industry. For example, when you turn your channel selection knob on your Zenith TV set, the selector is riding on a track of silver "paint".

And insofar as silver conductive adhesive, or **Silver Epoxy**, is concerned, it is packaged in syringes for sale to the semi-conductor industry for use in a "dotting" process employed to assure conductive adhesion between a chip and its package. The silver conductive adhesive also acts to drain off heat and excess electricity. The makers of quartz crystal watches also use Silver Epoxy, as do

the air and space industries. This use of silver conductive adhesive as a "*cold conductive solder*" is partly explained by the fact that many people would not want to use a soldering iron if the parts to be bonded were inaccessible, or very delicate, or situated near to something which is heat sensitive. For example, who would willingly hot-solder a component back onto a circuitry board which is made of delicate plastic? Or again, glass is now a very fashionable surface upon which to place electronic circuitry. Take for instance, some de-icing screens in motor car windows. If one of the tracks is broken, how will you repair it? A dangerous method with a soldering iron is not appropriate. Some screens can now be simply repaired with conductive paint and a brush. Many silver conductive plastic products are available from the companies listed above, or from: **Technical Wire Products, Inc.**, 129 Dermody Street, Cranford, N.J. 07016; **Chomerics, Inc.**, 77 Dragon Court, Woburn, Massachusetts 01888; **Engelhard Hanovia Thick Film Division**, 1 West Central Ave., East Newark, N.J. 07029; and **Demetron GmbH**, Leipsiger Strasse, 10, 6450 Hanau, West Germany.



Silver membrane touch switches are used in keyboards of modern microcomputers, copiers, organs, spectrum analyzers and industrial controls.

Products, Inc., 129 Dermody Street, Cranford, N.J. 07016; **Chomerics, Inc.**, 77 Dragon Court, Woburn, Massachusetts 01888; **Engelhard Hanovia Thick Film Division**, 1 West Central Ave., East Newark, N.J. 07029; and **Demetron GmbH**, Leipsiger Strasse, 10, 6450 Hanau, West Germany.

SILVER MEMBRANES TOUCH YOUR FUTURE

When your fingers touch the numbers on a perfectly smooth, buttonless keyboard of one of the newest calculators, you literally have one of the most dramatic growth areas of the conductive plastics market at your fingertips . . . **Membrane touch switches**. These, essentially, are pieces of plastic with a silver paint printed onto them. Already, according to Mr. Proctor, these components are economical primarily because they can be made quickly and reproduced accurately by modern printing techniques.

Mr. Proctor added, "Speed of production is the essence of component manufacture in so many situations today. One new developing range of silver conductive plastics is the type that cures by exposure to ultraviolet light—instantly. It is now possible to deposit very thin controlled films of silver conductive plastic at exceptionally fast speeds and dry them immediately."

Mr. Ron Selwood of Johnson Matthey's Wayne, Pennsylvania organization noted that in

addition to the use by the calculator industry, silver membrane touch switches are also being used in modern elevators and cash registers; however, Mr. Selwood sees the greatest short term growth potential as coming from the automobile industry which is "only a couple of years" away from a knobless dashboard—with all items currently controlled by knobs or pushbuttons, changed over to silver membrane touch switch controls. "This change will not only facilitate many new dashboard design improvements, but will tend to increase the efficiency of the affected controls at the same time the new silver switches decrease maintenance needs." said Mr. Selwood.

Already producing silver membrane touch systems are **Rogers Corporation** of Rogers, Connecticut 06263; **Oak Industries Inc.**, 16935 West Bernardo Drive, Rancho Bernardo, California 92718; and **Centralab**, 5757 North Green Bay Avenue, Milwaukee, Wisconsin 53201.

SILVER INSTITUTE WELCOMES NEW MEMBER

The Silver Institute has cordially welcomed to membership **Exxon Minerals Company**, 1251 Avenue of the Americas, New York, N.Y. 10020, with its Manager, Business Environment & Commodity Analysis Division, J.L. Way, as its Official Representative in Institute affairs. Its Alternate Official Representative is J.T. Graham, Manager, Commodity Analysis.

SILVER IMPORTANT AS STORE OF VALUE

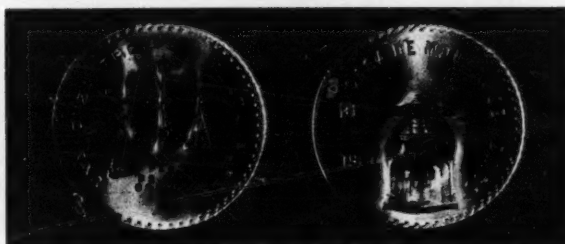
Because many ancient monies were defined by their weight, it is possible to convert their value into 1980 dollar approximations. Using this technique, "The tabernacle built by Moses (Exodus 38: 20-30) cost more than \$20,000,000." said Mr. Pierre Gérin-Jean, President of the **Société Minière et Métallurgique de Peñarroya**, Tour Main-Montparnasse, 33, avenue du Main, 75751 Paris Cedex 15, France, during the **American Metal Market's Gold and Silver Forum**, held in New York City in January.

In discussing silver's current role as a store of value, Mr. Gérin-Jean analysed its value as a price for a barrel of oil, and said that this price has not varied very much. He added that expressed in weight of silver, it has oscillated between 1.0 and 2.7 ounces for most of the time during the past decade. Recently, a barrel of oil was equivalent in price to something over two ounces of silver, or what it was worth in the 1950's and, roughly speaking, what it has been worth since 1974.

Mr. Gérin-Jean suggested that in view of silver's long term importance as a store of value, the day may come when some of the larger producer countries of the Americas might again count some silver among their international monetary reserves, and foster large scale international, popular use of silver for savings by minting and actively marketing silver bullion coins similar to the gold Krugerrand, the Canadian Maple Leaf and the Mexican 50-Peso piece.

Although Mexico has not yet actively promoted its silver bullion piece internationally, it has indeed recognized silver's role as a store of value and the need for a piece containing exactly one troy ounce of pure silver. In 1949, Mexico minted one million 925 fine sterling silver "Onza Troy" bullion pieces. With an increasing demand, Mexico issued 4,788,000 in 1978-1979, and in 1980 another 5,056,000 "Onzas" to supply the Mexican and international coin collecting and investment communities. Formerly, in Mexico, only the Banco de México sold them. Today the "Onza Troy" (shown below) is bought and sold daily by all Mexican commercial banks, thus making it a liquid asset as well as a store of value.

In other nations, the "Onza" can be purchased from coin dealers, such as the well known firm of **Almanzar's Coins of the World, Inc.**, Bank of San Antonio Bldg., Suite 208, One Romana Plaza, San Antonio, Texas 78205 and others. Anticipating increased demand for the "Onza Troy", Almanzar's has recently replenished its stock of "Onzas" which are being sold in lots of 1, 2, 10 and 100.



LATEST SILVER INSTITUTE REFINING STATISTICS

Production and Disposition of 999 Silver Bars by All Known Refiners in the United States

	TROY OUNCES		MILLION TROY OUNCES			
	February 1981	Feb 1981	Jan 1981	Jan-Feb 1981	Jan-Feb 1980	Full Yr 1980
THESE REFINERS' PRODUCTION, BY SOURCE						
From Primary (ores & concentrates)	3,872,733	3.9	3.6	3.7	5.2	3.4
From Coins	372,682	0.4	0.3	0.4	3.3	1.4
From Old Scrap (used photo film & other products)	5,133,537	5.1	6.1	5.6	6.5	6.2
From New Scrap (in-plant clippings, waste)*	2,610,903	2.6	2.8	2.7	2.8	2.8
TOTAL PRODUCTION	11,989,855	12.0	12.9	12.4	17.8	13.9
TOTAL PRODUCTION Less New Scrap*	9,378,952	9.4	10.1	9.7	15.0	11.1
ABOVE TOTAL PRODUCTION, BY OWNERSHIP						
From Refiners' Own or Purchased Materials	8,478,011	8.5	9.1	8.8	12.1	9.2
Refined on Toll for Others	3,511,844	3.5	3.7	3.6	5.8	4.7
DISPOSITION BY THESE REFINERS						
Converted in Plant (consumed in fabricating, etc.)	3,668,965	3.7	4.5	4.1	5.5	4.9
Shipped Out: Own materials	4,087,796	4.1	4.2	4.1	5.4	4.5
Against Tolls	3,503,034	3.5	3.6	3.6	5.6	4.5
TOTAL DISPOSITION	11,259,795	11.3	12.3	11.8	16.6	13.9
TOTAL DISPOSITION Less New Scrap*	8,648,892	8.6	9.5	9.1	13.8	11.1
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)						
	+730,060	+0.7	+0.5	+1.3	+2.4	-0.5
THESE REFINERS' STOCKS AT END OF PERIOD	2,374,073	2.4	1.6	2.4	4.0	1.1

Production and Disposition of 999 Silver Bars by All Known Refiners in Australia, Canada, Mexico, Peru, South Africa and Sweden; and some other Refiners in Europe and Asia.

	TROY OUNCES		MILLION TROY OUNCES			
	February 1981	Feb 1981	Jan 1981	Jan-Feb 1981	Jan-Feb 1980	Full Yr **1980
THESE REFINERS' PRODUCTION, BY SOURCE						
From Primary (ores & concentrates)	12,232,333	12.2	11.7	12.0	12.9	12.0
From Coins	78,257	0.1	0.3	0.2	0.1	0.1
From Old Scrap (used photo film & other products)	5,385,144	5.4	6.1	5.7	8.3	7.4
From New Scrap (in-plant clippings, waste)*	1,068,399	1.1	1.3	1.2	1.7	1.4
TOTAL PRODUCTION	18,764,133	18.8	19.4	19.1	22.9	21.0
TOTAL PRODUCTION Less New Scrap*	17,695,734	17.7	18.1	17.9	21.3	19.5
ABOVE TOTAL PRODUCTION, BY OWNERSHIP						
From Refiners' Own or Purchased Materials	15,355,139	15.4	16.5	15.9	18.6	17.2
Refined on Toll for Others	3,408,994	3.4	2.9	3.2	4.3	3.8
DISPOSITION BY THESE REFINERS						
Converted in Plant (consumed in fabricating, etc.)	4,982,286	5.0	5.9	5.5	8.6	7.0
Shipped Out: Own materials	11,721,676	11.7	10.9	11.3	11.0	10.4
Against Tolls	3,506,077	3.5	2.7	3.1	3.2	3.3
TOTAL DISPOSITION	20,210,039	20.2	19.5	19.8	22.8	20.8
TOTAL DISPOSITION Less New Scrap*	19,141,640	19.1	18.1	18.6	21.1	19.3
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)						
	-1,445,906	-1.4	-0.1	-1.5	+0.3	+2.3
THESE REFINERS' STOCKS AT END OF PERIOD	6,121,680	6.1	7.6	6.1	5.6	7.6

* PRODUCTION From New Scrap is 999 silver made from in-plant clippings, spillage, sweepings, etc., generated during manufacturing processes; since it is in continuous cycle from new scrap to 999 silver, to new scrap, some like to see the production and disposition totals after deducting the new scrap from both.

** Revised

THE SILVER INSTITUTE

A WORLDWIDE ASSOCIATION OF MINERS, REFINERS, FABRICATORS AND MANUFACTURERS
INCORPORATED 1971

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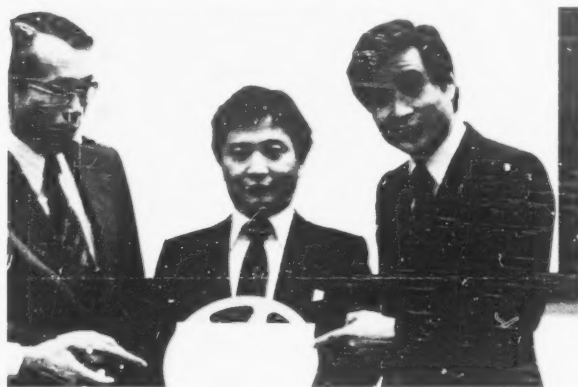
THE SILVER INSTITUTE LETTER

INFORMATION ON SILVER FOR INDUSTRY

VOLUME XI, NUMBER 4

APRIL 1981

ADDITIONAL LANGUAGE VERSIONS OF "SILVER" MOVIE



Photos by Barbara Moynihan

Above, l. to r.: Yoshituki Shibuya of Nippon Mining Co., Ltd., Hisashi Uchida and Seiichi Ohtsuki of Mitsubishi Metal Corp. with Japanese film "Silver."

フィルム金銀は大変
素朴で美しいフィルムです

Left, François Guillaumot of Comptoir Lyon-Alemand Louyot.

After viewing the French language version of the beautiful color sound film "Silver," François Guillaumot of **Comptoir Lyon-Alemand Louyot**, 13, rue de Montmorency, 75139 Paris Cedex 03, France, exclaimed, "C'est un excellent film montrant parfaitement la production et les utilisations de l'argent." Participating in the preparation of Japanese language titles for the Japanese narrated film were Hisashi Uchida and Seiichi Ohtsuki of **Mitsubishi Metal Corp.**, 277 Park Ave., New York, N.Y. 10017 and Yoshituki Shibuya of **Nippon Mining Co., Ltd.**, 6 East 43rd Street, New York, N.Y. 10017, whose favorable comment is shown at left. On April 29, each of the five language versions of "Silver" (English, French, German, Japanese and Spanish) will be shown in London, England during a meeting of The Silver Institute. Any of the five language versions of the film may be purchased from The Silver Institute for US \$250.

NEW MEMBERS WELCOMED

The Silver Institute cordially welcomes to membership the following companies: **Sociedad Española de Metales Preciosos, S.A.**, Albarracín, 37, Madrid-4, Spain with its Secretary General J. Permuy as its Official Representative in Institute affairs; and **W.C. Heraeus GmbH**, Heraeusstrasse 12-14, Postfach 1553, D-6450 Hanau, Federal Republic of Germany, represented in Institute matters by its Director, Gerhard Mai.

SILVER ALLOY STANDARDS

So that engineers throughout industry can more readily select and specify silver alloys in their products, The Silver Institute promulgates silver alloy standards. In this work it serves as coordinator for the silver industry in the internationally used **SAE-ASTM Unified Numbering System for Metals and Alloys**—as is done by the Aluminum Association, American Iron & Steel Institute, Copper Development Association, and The Gold Institute, for their respective industries.

The Silver Institute Unified Numbering System Committee includes Arnold J. Lincoln of **Engelhard**, David R. Jordan of **Johnson Matthey**, Donald A. Corrigan of **Handy & Harman**, W. A. Schaller of **Degussa**, Michael K. Weiss of **Bunker Hill**, P. Leger of **Comptoir Lyon-Alemand**, and is chaired by Richard L. Davies of The Silver Institute.

Two additional silver alloy standards have now been forwarded for the Unified Numbering System. Sterling silver with a nominal composition of 92.5% silver and 7.5% copper has long been used as an alloy which exhibits beautiful permanence like that of pure silver, but with increased hardness and strength. It is not only the alloy of choice for making elegant silver flatware, holloware and coins, but industrial engineers are finding it ideal for an increasing number of industrial applications, such as

seals and other equipment for safely handling the great volumes of oxygen used in rocket engines, welding, and steel-making. Silver Institute specifications defining two grades of this alloy are shown below.

Silver Institute Specification SI ST9210 for			Silver Institute Specification SI ST9250 for		
STERLING SILVER-SILVERSMITHS GRADE			STERLING SILVER-SILVERSMITHS GRADE		
	Min.	Max.		Min.	Max.
Silver	92.10%	93.50%	Silver	92.50%	93.50%
Copper	6.50%	7.90%	Copper	6.50%	7.50%
Zinc	—	0.06%	Zinc	—	0.06%
Iron	—	0.05%	Iron	—	0.05%
Cadmium	—	0.05%	Cadmium	—	0.05%
Lead	—	0.03%	Lead	—	0.03%
Other elements	—	0.06%	Other elements	—	0.06%

WEST GERMAN INDUSTRIAL USES OF SILVER

"Silver is being increasingly used in technical products because of its exceptional physical and chemical properties" said Dr. Manfred Poniatowski of **Degussa Hanau**, Postfach 1351, Leipziger Strasse 10, D-6540 Hanau 1, Federal Republic of Germany during a recent Silver Symposium held at the Non Ferrous Metals Information Center in Brussels, Belgium.

Dr. Poniatowski noted that in West Germany, industrial consumption of silver per year has been running at about 40 million troy ounces, "42% supplied by smelting and refining of foreign ores, 2% from German mine production and the rest imported in different forms." Photography consumes about 39% of the silver used, with the electrical and electronics industrial group as second largest consumer at 25%, silverware and jewelry third at 18% followed by soldering and brazing alloys (8%), catalysts (5%) and miscellaneous (5%).

"In Degussa's Hanau plant, for example," Dr. Poniatowski added, "**The two main processing lines for silver are the production of fine silver and silver-copper alloys**, starting with continuous casting and ending with semi-finished products such as sheet, strip, wire, blanks and tubes for anodes, jewelry and silverware and other decorative applications; **and, the production of sintered compound materials**, starting with powder blending, extrusion, and ending with preforms for electrical contacts, or even complete contacts." Fifteen different silver-copper alloys are made by Degussa, and provisions are made for continuous sampling and analysis of each alloy to assure precise uniform composition.

Using silver sheets or strips, Degussa produces blanks for use in the production of coins and medals. He explained, "There are two general qualities: Proof quality with a very smooth surface, giving a mirror effect. The fine silver is rolled with very finely polished rolls, and the work area is maintained as clean and as dust-free as possible; Standard quality, which is generally specified for coins and consists of silver-copper alloys." After the final rolling, the strip is conveyed by an automatic feed unit to a stamping press.

About 10-15% of Germany's industrial consumption of silver is for electrical contacts. Silver is used as an electrical contact material because silver has "the highest electrical and thermal conductivities of any metal and because of its resistance to atmospheric oxidation." Degussa has found that silver containing 10% to 40% nickel is ideal for circuit breakers and disconnect switches. Silver containing 3% to 5% graphite is used for many high performance make-and-break electronic contacts.

Below. Silver Institute Vice President Werner Knies of Degussa and Degussa Hanau plant.



PATRIOTS, CHILDREN AND DISABLED PERSONS ON SILVER COINS

Throughout the world, silver coins have been minted through the centuries to honor historic national leaders and patriots. In 1932, on George Washington's 200th birthday, a special commemorative quarter dollar was produced to honor the occasion, and it proved to be so popular that it is still produced today as the design of the currently circulating quarter. In March 1981, Representative D. Douglas Barnard of Georgia introduced a bill in the U.S. House of Representatives which, if passed and signed into law by President Reagan, would **authorize the striking of a minimum of 10 million 90-percent silver commemorative half dollars marking the 250th anniversary of Washington's birth in 1982.**

Mr. Barnard said that his bill calls for "as wide a distribution system as possible" so that anyone who wants to purchase the Washington commemorative coin will get the chance. He added, "They will be legal tender, and will be the same size and weight as the silver half dollars that were produced in this country until 1965." This coin would be sold at a premium which would, according to Representative Barnard, "cover the costs of producing the coin . . . but will be kept as low as possible to insure wide distribution." He noted, "George Washington's administration established our system of coinage, which is so practical that it has been copied by most of the nations of this Earth to some extent. It is only fitting that his 250th birthday be commemorated on a special coin."

But silver coins have been used to commemorate many other significant events, activities or causes. One of the most popular recent series of silver coinages was international in nature, and dedicated to **The International Year of the Child (IYC)**, sponsored by the UNICEF in an effort to get governments, organizations and individuals throughout the world to reaffirm their concern for the needs of children everywhere. Beautiful silver coins were minted by Bulgaria, Bolivia, Hungary, Philippines, Ethiopia, Maldives, United Arab Emirates, Netherlands Antilles (*shown*) and other nations. Royalties from this program are used by UN agencies and participating governments to benefit needy children worldwide.



And now, silver coins will be issued by as many as 24 countries to commemorate the **International Year of the Disabled Person**. The program is sponsored by the UNICEF and managed by Great Britain's **Royal Mint**, 7 Grosvenor Gardens, London, SW1W OBH England. These silver coins will portray persons of merit or fame who have achieved their positions in spite of disabilities, and "Great Healers" who have improved the conditions of the sick and disabled.

MIGHTY MINIATURE SILVER BATTERIES

A new silver battery weighing only an ounce and a half, can now provide temporary emergency power at one hundredth of a second notice, to maintain the integrity of a computer system while power from other sources is being connected.

The same kind of silver battery can protect air travelers. Hundreds of operations in flying a commercial airplane must be run by electricity. Now, within a second after any power interruption, a little 22 pound silver battery is ready to produce electricity equivalent to 6,700 watts (9 horsepower) continuously for three minutes.

These emergency batteries were developed by Dr. Werner Böhnstedt of **Silberkraft Leicht-akkumulatoren, GmbH**, Meidericher Str. 6-8, D-4100 Duisburg I, West Germany. They are composed of stacks of paper-thin duplex electrodes containing silver, silver oxide and zinc, ready to be instantly activated when contacted by the separately contained electrolyte. The batteries will maintain their readiness for as long as 10 years, and are impervious to both high and low temperature.

This industrial development is one of the 70 summarized in the new April issue of The Silver Institute publication, **New Silver Technology**. The wide range of them includes silver coated molds for continuous casting of steel developed by Nishio Metarijingu K.K. of Kobe Port, Japan. In addition to Germany and Japan, this issue presents summaries of silver developments from Austria, Canada, England, France, India, Israel, Sweden, the United States and Yugoslavia.

LATEST SILVER INSTITUTE REFINING STATISTICS

Production and Disposition of **999 Silver Bars** by All Known Refiners in the United States

	TROY OUNCES	MILLION TROY OUNCES				
	March 1981	Mar 1981	Feb 1981	Jan-Mar 1981	Jan-Mar 1980	Full Yr 1980
THESE REFINERS' PRODUCTION, BY SOURCE						
From Primary (ores & concentrates)	4,621,864	4.6	3.9	4.0	5.0	3.4
From Coins	401,655	0.4	0.4	0.4	2.8	1.4
From Old Scrap (used photo film & other products)	4,804,653	4.8	5.1	5.4	6.7	6.2
From New Scrap (in-plant clippings, waste)*	1,524,223	1.5	2.6	2.3	3.3	2.8
TOTAL PRODUCTION	11,352,395	11.4	12.0	12.1	17.8	13.9
TOTAL PRODUCTION Less New Scrap*	9,828,172	9.8	9.4	9.8	14.4	11.1
ABOVE TOTAL PRODUCTION, BY OWNERSHIP						
From Refiners' Own or Purchased Materials	8,005,011	8.0	8.5	8.5	12.2	9.2
Refined on Toll for Others	3,347,384	3.3	3.5	3.5	5.6	4.7
DISPOSITION BY THESE REFINERS						
Converted in Plant (consumed in fabricating, etc.)	2,630,420	2.6	3.7	3.6	6.0	4.9
Shipped Out: Own materials	5,370,923	5.4	4.1	4.6	5.7	4.5
Against Tolls	2,945,245	2.9	3.5	3.4	5.0	4.5
TOTAL DISPOSITION	10,946,588	10.9	11.3	11.5	16.7	13.9
TOTAL DISPOSITION Less New Scrap*	9,422,365	9.4	8.6	9.2	13.4	11.1
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)						
	+405,807	+0.4	+0.7	+1.7	+3.1	-0.5
THESE REFINERS' STOCKS AT END OF PERIOD	2,779,880	2.8	2.4	2.8	4.7	1.1

Production and Disposition of **999 Silver Bars** by All Known Refiners in Australia, Canada, Mexico, Peru, South Africa and Sweden; and some other Refiners in Europe and Asia.

	TROY OUNCES	MILLION TROY OUNCES				
	March 1981	Mar 1981	Feb 1981	Jan-Mar 1981	Jan-Mar 1980	Full Yr 1980
THESE REFINERS' PRODUCTION, BY SOURCE						
From Primary (ores & concentrates)	12,287,289	12.3	12.2	12.1	12.9	12.0
From Coins	62,463	0.1	0.1	0.1	0.2	0.1
From Old Scrap (used photo film & other products)	7,258,798	7.3	5.4	6.2	8.9	7.4
From New Scrap (in-plant clippings, waste)*	1,370,171	1.4	1.1	1.3	1.7	1.4
TOTAL PRODUCTION	20,978,721	21.0	18.8	19.7	23.8	21.0
TOTAL PRODUCTION Less New Scrap*	19,608,550	19.6	17.7	18.5	22.0	19.5
ABOVE TOTAL PRODUCTION, BY OWNERSHIP						
From Refiners' Own or Purchased Materials	16,804,037	16.8	15.4	16.2	19.3	17.2
Refined on Toll for Others	4,174,684	4.2	3.4	3.5	4.5	3.8
DISPOSITION BY THESE REFINERS						
Converted in Plant (consumed in fabricating, etc.)	5,882,263	5.9	5.0	5.6	9.3	7.0
Shipped Out: Own materials	9,949,013	9.9	11.7	10.9	10.7	10.4
Against Tolls	4,065,087	4.1	3.5	3.4	3.3	3.3
TOTAL DISPOSITION	19,896,363	19.9	20.2	19.9	23.3	20.8
TOTAL DISPOSITION Less New Scrap*	18,526,192	18.5	19.1	18.6	21.6	19.3
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)						
	+1,082,358	+1.1	-1.4	-0.4	+1.4	+2.3
THESE REFINERS' STOCKS AT END OF PERIOD	7,204,038	7.2	6.1	7.2	6.7	7.6

* PRODUCTION From New Scrap is 999 silver made from in-plant clippings, spillage, sweepings, etc., generated during manufacturing processes; since it is in continuous cycle from new scrap to 999 silver, to new scrap, some like to see the production and disposition totals after deducting the new scrap from both.

** Revised

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THE SILVER INSTITUTE LETTER

INFORMATION ON SILVER FOR INDUSTRY

VOLUME XI, NUMBER 5

MAY 1981

REGIONAL MEETINGS IN LONDON

More than a hundred representatives of Silver Institute member companies and guests from 15 countries attended a series of Regional Meetings of The Silver Institute in London, England April 28-30. The meetings were led by Institute Chairman Charles D. Snead, Jr. of Callahan Mining Co., U.S.A.; Institute President Bernhard Rohe of Peñoles, Mexico; and Institute Vice President Werner Knies of Degussa, Germany. These began with a reception on April 28, continuing with a formal banquet at the historic Clothworkers' Guild Hall.

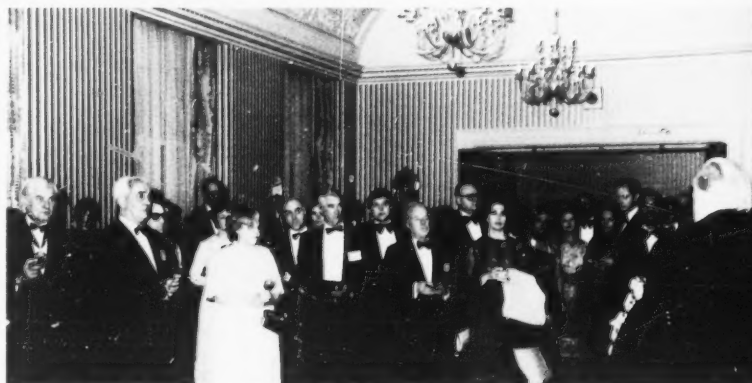
There, the Clothworkers' Co., begun in 1582, maintains a spectacular collection of sterling silver pieces—many the gifts to the Guild by each Master at the end of his service, including Samuel Pepys. A handsome silver piece from the collection graced each dining table at the banquet, and in front of the head table was a collection of modern British sterling silver flatware and holloware.

The Right Honourable Lord Mancroft, past President of the British Institute of Marketing, addressed the dinner, giving descriptions of the importance of British silver historically and today. He also spoke of the outstanding silver coins produced by the Royal Mint for Britain, Venezuela, Afghanistan, Costa Rica, Zambia, Bahamas, Tanzania, Sudan, Pakistan, Botswana and many other countries.

Right, opposite:
George and Lillian Havener, James A. Orser and Jean Louis Danis.

Right, below:
John W. Morgan with Mr. & Mrs. J. L. Davies.

Below:
On the Clothworkers' Hall Reception Landing, Institute Chairman Charles D. Snead, Jr. and his wife, Marron (Ronny), stand beside the 'Golden Ram' which represents the Clothworkers' crest.



The Clothworkers' Company Beadle, H.A. Cross (extreme right) tells Silver Institute group and the Master of the Clothworkers' Company, Thomas Girtin (extreme left) about the Company, its Hall and its history.



Lord Mancroft shows Mary Rohe, Institute President Bernhard Rohe and Lady Mancroft one of Clothworkers' Hall sterling silver pitchers.





Dennis Suskind, Maria B. Hart and A.M.B. Hart. Kenneth and Carleen Canfield.



Tom B. Børresen, Alex Schmidt-Fellner and Ed Hoffstatter.



Dorothy and Rafael Errázuriz.



Jeanine and Herbert Coyne.



Peter and Diane Short with David and Patsy Seed.



Ronald and Rosa Gillespie.



Mr. & Mrs. F. F. Wolff, Rudolph Wolff-Noranda hosted a luncheon at the London Metal Exchange.



Kenneth and Betty Barrett, Britannia Refined Metals Ltd., contributed greatly to the success of the Institute's London meetings.

BRITANNIA REFINED METALS MARKS 50TH ANNIVERSARY

On April 29, the representatives of The Silver Institute visited the impressive Northfleet Refinery of member company, Britannia Refined Metals, where they watched tons of unpurified metals come by ship from Mount Isa Mines in Australia and saw it efficiently transformed (**see furnace tapping step shown opposite**) into pure lead, with the silver content produced as pure silver bars, ready for use for sterlingware and a myriad of industrial products. Along with officials of M.I.M. Holdings, ASARCO and other related companies responsible for this great enterprise, The Silver Institute representatives were guests of the company's 50th Anniversary Luncheon.

Upon return to London from Northfleet, members had the opportunity of seeing the English, French, Spanish, German and Japanese versions of the new film **SILVER** with its depiction of today's widespread use of silver.

REPORTS ON THE SILVER INDUSTRY FROM 14 NATIONS



Institute Chairman Charles D. Snead, Jr. and Institute President Bernhard Rohe.

On April 30, participants in the London Regional Meetings of The Silver Institute convened for a breakfast meeting in the Hilton Hotel. After introductions by Institute Chairman Charles D. Snead, Jr., and Institute President Bernhard Rohe, Werner Knies, Vice President of The Silver Institute for Europe and Africa called on officials of companies from the various countries to report their observations on current developments in the production and use of silver and silver products. Those reporting included Kenneth Barrett of Britannia Refined Metals, Great Britain; Rene Marbot of Entores, France; Tom B Børresen of Boliden, Sweden; Fernand Roux of Métaux Précieux, Switzerland; Gerhard Mai of Heraeus, Germany; Adalbert Prior of Ögussa, Austria; Kazunari Sugimoto of Nippon Mining Co., Japan; H. Llyn Evans of Broken Hill Associated



*Institute Vice President
Werner Knies led the Break-
fast Meeting.*

Smelters, Australia; Rafael Errazuriz of Sali Hochschild, Chile; Bernhard Rohe of Peñoles, Mexico; Robert Reininger of Rosario Resources, Honduras; Keith Hendrick of Noranda, Canada; Victor Manuel Beras of Rosario Dominicana, Dominican Republic; and Sohier Marks of Mocatta Metals, USA. Some of those reporting urged that The Silver Institute increase its activities of technical and market development to assist users and potential users of silver and silver products. These reports from miners, refiners, manufacturers and dealers—producers and users—from various parts of the world, underlined the diversity, the challenges and the resiliency of the industry.



Timothy Roberts of Britannia Refined Metals Ltd., U.K., receives a sterling silver money clip from Peggie Davies of The Silver Institute as a token of the Institute's gratitude for all that he and his wife, Patricia, did to assure the success of the London Regional Meetings.



*R. Reininger,
Honduras*



*A. Prior,
Austria*



*H.L. Evans,
Australia*



*S. Marks,
U.S.A.*



*K.C. Hendrick,
Canada*



*K. Sugimoto,
Japan*



*A. Schmidt-Fellner,
U.S.A.*



*F. Roux,
Switzerland*



*V.M. Beras,
Dom. Repub.*



*J.L. Rice,
U.S.A.*



*R. Marbot,
France*



*G. Mai,
Germany*



*D.E.P. Lindh,
U.S.A.*



*and T.B. Börresen,
Sweden.*

*... reported on
silver and silver
products.*

INSTITUTE WELCOMES NEW MEMBERS

The Silver Institute warmly welcomes the following new members: **Academy Corporation**, 6905 Washington, N.E., Albuquerque, New Mexico 87109, represented in Institute affairs by its President Keith E. Philippi; **Hallmark Precious Metals, Inc.**, 9725 S.E. 36th Street, Suite 200, Mercer Island, Washington 98040 with its President Marvin E. Senff as Official Representative to the Institute; **Ögussa**, Gumpendorfer Strasse 83-85, Postfach 111, A-1061 Vienna, Austria represented in Institute matters by Dr. Adalbert Prior; and **United States Smelting and Refining, Inc.**, 814 West Haines Street, Plant City, Florida 33566 with President David W. Caldwell as its representative to the Institute.

FASCINATING HISTORICAL PERSPECTIVE ON STORES OF VALUE

The Silver Institute is proud to enclose with this issue of **The Silver Institute Letter**, a copy of the important address on "Gold and Silver as Stores of Value", by Simon D. Strauss (pictured at right) of ASARCO, a founder and the Chairman Emeritus of The Silver Institute.



LATEST SILVER INSTITUTE REFINING STATISTICS

Production and Disposition of **999 Silver Bars** by All Known Refiners in the United States

	TROY OUNCES	MILLION TROY OUNCES				
	April 1981	Apr 1981	Mar 1981	Jan-Apr 1981	Jan-Apr 1980	Full Yr 1980
THESE REFINERS' PRODUCTION, BY SOURCE						
			<i>MONTHLY RATE</i>			
From Primary (ores & concentrates)	3,689,844	3.7	4.6	3.9	4.7	3.4
From Coins	70,130	0.1	0.4	0.3	2.5	1.4
From Old Scrap (used photo film & other products)	5,609,128	5.6	4.8	5.4	*7.3	6.2
From New Scrap (in-plant clippings, waste)*	2,519,822	2.5	1.5	2.4	3.1	2.8
TOTAL PRODUCTION	11,888,924	11.9	11.4	12.0	17.6	13.9
TOTAL PRODUCTION Less New Scrap*	9,369,102	9.4	9.8	9.7	14.5	11.1
ABOVE TOTAL PRODUCTION, BY OWNERSHIP						
From Refiners' Own or Purchased Materials	8,379,687	8.4	8.0	8.5	11.8	9.2
Refined on Toll for Others	3,509,237	3.5	3.3	3.5	5.7	4.7
DISPOSITION BY THESE REFINERS						
Converted in Plant (consumed in fabricating, etc.)	3,603,615	3.6	2.6	3.6	5.9	4.9
Shipped Out: Own materials	4,615,220	4.6	5.4	4.6	6.0	4.5
Against Tolls	3,012,706	3.0	2.9	3.3	5.4	4.5
TOTAL DISPOSITION	11,231,541	11.2	10.9	11.4	17.2	13.9
TOTAL DISPOSITION Less New Scrap*	8,711,719	8.7	9.4	9.1	14.1	11.1
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)						
	+ 657,383	+ 0.7	+ 0.4	+ 2.3	+ 1.4	- 0.5
THESE REFINERS' STOCKS AT END OF PERIOD	3,437,263	3.4	2.8	3.4	2.9	1.1

Production and Disposition of **999 Silver Bars** by All Known Refiners in Australia, Canada, Mexico, Peru, South Africa and Sweden; and some other Refiners in Europe and Asia.

	TROY OUNCES	MILLION TROY OUNCES				
	April 1981	Apr 1981	Mar 1981	Jan-Apr 1981	Jan-Apr 1980	Full Yr 1980
THESE REFINERS' PRODUCTION, BY SOURCE						
			<i>MONTHLY RATE</i>			
From Primary (ores & concentrates)	13,701,413	13.7	12.3	12.5	12.8	12.0
From Coins	1,706	0.0+	0.1	0.1	0.2	0.1
From Old Scrap (used photo film & other products)	6,384,995	6.4	7.3	6.3	8.6	7.4
From New Scrap (in-plant clippings, waste)*	1,216,518	1.2	1.4	1.2	1.7	1.4
TOTAL PRODUCTION	21,304,632	21.3	21.0	20.1	23.3	21.0
TOTAL PRODUCTION Less New Scrap*	20,088,114	20.1	19.6	18.9	21.6	19.5
ABOVE TOTAL PRODUCTION, BY OWNERSHIP						
From Refiners' Own or Purchased Materials	18,373,365	18.4	16.8	16.8	19.0	17.2
Refined on Toll for Others	2,931,267	2.9	4.2	3.4	4.3	3.8
DISPOSITION BY THESE REFINERS						
Converted in Plant (consumed in fabricating, etc.)	6,128,674	6.1	5.9	5.7	9.0	7.0
Shipped Out: Own materials	10,823,098	10.8	9.9	10.8	10.4	10.4
Against Tolls	2,740,836	2.7	4.1	3.2	3.2	3.3
TOTAL DISPOSITION	19,692,608	19.7	19.9	19.8	22.6	20.8
TOTAL DISPOSITION Less New Scrap*	18,476,090	18.5	18.5	18.6	20.9	19.3
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)						
	+ 1,612,024	+ 1.6	+ 1.1	+ 1.2	+ 2.8	+ 2.3
THESE REFINERS' STOCKS AT END OF PERIOD	8,816,062	8.8	7.2	8.8	8.1	7.6

* PRODUCTION From New Scrap is 999 silver made from in-plant clippings, spillage, sweepings, etc., generated during manufacturing processes; since it is in continuous cycle from new scrap to 999 silver, to new scrap, some like to see the production and disposition totals after deducting the new scrap from both.

THE SILVER INSTITUTE

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1001 Connecticut Avenue NW, Washington, D.C. 20036. Tel. (202) 331-1485 and 331-1228

THE SILVER INSTITUTE LETTER

INFORMATION ON SILVER FOR INDUSTRY

VOLUME XI NUMBER 6

JUNE 1981

WORLD MINES PRODUCED LESS SILVER IN 1980

During the eleventh Annual Meeting of The Silver Institute in the Yale Club of New York City on June 10, members and guests of The Silver Institute received copies of the Institute's **Mine Production of Silver in 1980** which reported world mine production of silver dropped from 345.2 million troy ounces in 1979 to 331.1 million troy ounces in 1980.

However, the report on **Mine Production of Silver in 1980 with Projections for 1981, 1982, 1983 and 1984**, which was made with the participation of more than 260 mining and related enterprises, with headquarters in 36 countries, projects an increase of 7 percent in global mine production of silver in 1981, to bring total production up to 354 million troy ounces in this calendar year.

This study, which includes the amount of silver produced by each of the 61 countries that are known to mine this precious metal, notes that while 19 countries produced *more* silver in 1980 than in 1979 and 18 countries produced the *same* amount, there were 24 nations that *decreased* their mine production of silver from a total of 243.9 million troy ounces in 1979 to only 223.1 million in 1980. These included six of the largest silver producers in the world: Mexico, Peru, Canada, USA, Australia, and Poland. The United States alone decreased from 38.1 million troy ounces in 1979 to 30.4 million in 1980—a 7.7 million troy ounce decrease! The Soviet Union, with a mine production of 49.9 million troy ounces, had the largest mine production of silver in the world in 1980, as it had in 1979. However, Mexico is now projected to resume the lead position in the current calendar year.

Copies of **Mine Production of Silver—1980 with Projections for 1981, 1982, 1983 and 1984** may be obtained without charge by writing to the Silver Institute.

DISPLAYS OF THE BEAUTY AND UTILITY OF SILVER

The more than 100 persons attending the Annual Meeting of the Silver Institute were treated to a display of a gleaming array of silver ingots, art medals, coin-shaped pieces, medallions and jewelry fashioned by the skilled craftsmen of **The Metal Arts Company**, 230 Park Avenue, New York, N.Y. 10017. Mr. Stanley J. Dahle, Executive Vice President of The Metal Arts Co., noted that several of the beautiful items—including those made for Great American Insurance Co., Xerox, Citicorp, Cartier Jewelers and Tiffany and Co.—were produced to be used as awards in employee, sales and dealer incentive programs.

Mr. Dahle commented during his brief report, "We are finding that more and more major U.S. corporations are using silver in various forms as sales incentives for recognition and achievements, and as gifts. These silver items are in the form of bullion, jewelry, medallions and collector's plates. This comes as a result of the public's increased interest in and higher perceived value of silver." Metal Arts Company, founded in 1913, and **Sunshine Mining Company** of Dallas, Texas recently announced their intention to form a joint ven-



Above: Ron Selwood with Johnson Matthey display of silver conductive coatings and adhesives. **Below:** Stan Dahle with display of Metal Arts Co. silver ingots, medallions and other silver items. **Lower left:** Close-up of new silver "Sunshine" bullion piece by Sunshine Mining and Metal Arts companies.



ture to mint and market 999 fine silver "Sunshine" coin-shaped bullion pieces.

Another display showed samples of Johnson Matthey silver metallizing preparations, and demonstrated their applications. By combining specially processed tiny platelets of pure silver with thermoset resins, microscopically thin layers of silver can be coated on a variety of surfaces with extremely high conductivity at a very low cost. Ronald K. Selwood, Manager, Metallizing Preparations, **Johnson Matthey, Inc.**, Chemical Div., 456 Devon Park Drive, Wayne, Pennsylvania 19087, reported to the Annual Meeting that newer applications of conductive silver coatings and adhesives in membrane touch switches, auto rear window defoggers, solar cells, capacitors, resistors and semiconductors are bringing about "a dramatically increased useage of silver with tomorrow looking even brighter and more exciting for conductive silver coatings than today."

RECENT CHANGES IN SILVER PERFORMANCE

Striking changes have occurred in several aspects of the silver industry in the United States during the recent extremely volatile period, Silver Institute Executive Director, Richard L. Davies reported during the Institute's Annual Meeting. He presented data showing decreases in U.S. mine production, and the dramatic effect of sharp price changes on the production of 999 silver bars from old scrap and on the consumption of 999 silver in industry, as well as the apparent amount of investment in 999 silver.

Mr. Davies also noted, **"Further analyses show a net increase in monthly U.S. consumption of 999 silver in the first quarter of 1981 as compared with 1980.** An average monthly decrease of 383 thousand troy ounces per month for 5 categories of uses, was overbalanced by an average monthly increase of 1,215 thousand troy ounces per month in 8 other categories of use. This resulted in a net increase of 832 thousand troy ounces per month, raising the 1980 average of 10,433,000 troy ounces a month to 11,265,000 troy ounces per month used by U.S. industry in the first quarter of this year. **The 8 use categories registering increases** from full year 1980 to first quarter 1981 in average monthly U.S. consumption of 999 silver were: Contacts, Brazing, Electroplating, Jewelry, Photography, Dental, Catalysts and Miscellaneous uses.

SILVER INSTITUTE ELECTS NEW OFFICERS



During the Annual Meeting of the Silver Institute, the Nominating Committee under the Chairmanship of Robert M. Reiningger of Rosario Resources Corporation nominated and the membership elected Bernhard Rohe of Mexico's Industrias Peñoles, S.A. as **Chairman** of the Institute, and Alex Schmidt-Fellner (photo, left) of AMAX Inc. as **President**. Simon D. Strauss of ASARCO was elected **Chairman Emeritus** of the Institute.

The following **Regional Vice Presidents** were also elected: Kenneth R. Barrett of Britannia Refined Metals Limited for Europe and Africa; Kenneth A. Laidman of Engelhard Industries of Canada Limited for Canada; Francis H. Curren of Pease & Curren for Eastern United States; George G. Kent of The Bunker Hill Company for Western United States; Enrique Ibarra of Compañía de Real del Monte y Pachuca for México and Central America; Ernesto Baertl of Minas Arcata S.A. for South America; and Yoshihiro Inai of Mitsubishi Metal Corporation for Australia and Asia.

Front two rows, l. to r.: Directors attending the Annual Meeting, Karl G. Bergman of AMAX Inc.; Richard D. Mollison of Texasgulf Inc.; Ronald S. Gillespie of Industrial Minera México, S.A.; Alberto Benavides Q. of Cia. de Minas Buenaventura S.A.; Werner Knies of Degussa; Philip M. Lindstrom of Hecla Mining Co.; Keith C. Hendrick of Noranda Sales Corp. Ltd.; Enrique Ibarra I. of Cia. de Real del Monte y Pachuca; Harry M. Conger of Homestake Mining Co.; William P. Lohden of Callahan Mining Corp.; Charles D. Snead, Jr. of Callahan Mining Corp.; Bernhard Rohe of Industrias Peñoles, S.A.; David K. Fagin of Rosario Resources Corp.; A.M.B. Hart of Johnson Matthey Ltd.; Francis H. Curren, Jr. of Pease & Curren; Simon D. Strauss of ASARCO Inc.; Richard L. Davies of The Silver Institute. Back row, l. to r.: John H. Boyd of Kennecott Sales Corp.; C. Michael Boswell of Sunshine Mining Co.; Bob Ross of Engelhard Minerals & Chemicals Corp.; J.A.K. McPhail of INCO Metals Co.; and Robert M. Reiningger of Rosario Resources Corp.





Working in the Annual Meeting.

84 NATIONS ISSUED SILVER COINS IN 1980

In spite of the volatility of silver prices in 1980, 18 countries issued coins in 1980 which did *not* mint silver coins in the previous year. And for at least one country, the People's Republic of China, its 1980 silver coins marking the holding of the Winter Olympic Games in Lake Placid, New York, were the first silver coins ever issued by that nation.

Although mintage figures have not been received from several countries, including 15 countries that traditionally use the British Royal Mint to fulfil their coinage requirements, the data already processed for inclusion in **MODERN SILVER COINAGE—1980** indicate that at least 84 nations minted 243 different silver coinages in 1980.

Of the 84 silver coin issuing nations, 47 countries increased their coinages from the previous year. Among these nations are Belgium, German Democratic Republic, Great Britain, Italy, Mexico, Poland, Sweden, Norway, Venezuela and the USSR. The Isle of Man issued 15 different coinages, making it the producer of the largest variety of different silver coinages in 1980.

Beautiful silver coins were used to commemorate Christmas, the 80th birthday of Queen Elizabeth the Queen Mother, the Olympic Games, the International Year of the Child, and to promote the improvement of the lives of rural women, and to conserve the world's flora and fauna. But, according to **MODERN SILVER COINAGE—1980**, the largest single issue was the Mexican 925 fine sterling silver bullion "coin", called the "Onza Troy" because it contains exactly one troy ounce of pure silver. In 1979, Mexico issued 4,508,000 of the "Onzas", but had to increase its mintage to 5,056,000 in 1980 in order to satisfy popular demand for this piece. The second largest coinage was issued by Italy in the form of 1,500,000 silver 500 Lire coins depicting a lady of the Renaissance period on one side and three sailing ships of the same era on the other side.

MODERN SILVER COINAGE—1980 is being prepared with the cooperation of central banks, ministries of finance and mints throughout the world. This unique book includes precise data on the description, weight, dimension, fineness (pure silver percentage), number issued and other information for individual coins issued in 1980. It is available for only \$10 per copy, including postage, from The Silver Institute.

NEW INSTITUTE MEMBERS

Warm welcome to membership in The Silver Institute has been extended to **Security Metals Company**, 3208 Colvin Street, Alexandria, Virginia 22314 with President Ellen Hambleton serving as the Official Representative in Institute affairs; to **American Gold & Silver, Inc.** 7524 S.E. Foster Road, Portland, Oregon 97206, represented in Institute affairs by President H. Vance Guffey; and **Philipp Brothers Division of Philbro Corporation**, 1221 Avenue of the Americas, New York, New York 10020 represented in the Institute by Raymond Nessim, Group Vice President with John Mihale serving as the Alternate Representative. This brings the Institute's membership to 156 companies in 25 countries.

SILVER ALLOY STANDARDS

For the convenience of industries throughout the world, the SAE-ASTM Unified Numbering System for Metals and Alloys has now assigned official numbers to two Silver Institute designated alloys as shown to the right.

UNS NUMBER P07931 Silver Institute Specification SI-ST9210 for STERLING SILVER-STANDARD GRADE			UNS NUMBER P07932 Silver Institute Specification SI-ST9250 for STERLING SILVER-SILVERSMITHS GRADE		
	Min.	Max.		Min.	Max.
Silver	92.10%	93.50%	Silver	92.50%	93.50%
Copper	6.50%	7.90%	Copper	6.50%	7.50%
Zinc	—	0.06%	Zinc	—	0.06%
Iron	—	0.05%	Iron	—	0.05%
Cadmium	—	0.05%	Cadmium	—	0.05%
Lead	—	0.03%	Lead	—	0.03%
Other elements	—	0.06%	Other elements	—	0.06%

LATEST SILVER INSTITUTE REFINING STATISTICS

Production and Disposition of 999 Silver Bars by All Known Refiners in the United States

	TROY OUNCES		MILLION TROY OUNCES					
	May 1981	May 1981	Apr 1981	Jan-May 1981	Jan-May 1980	Full Yr 1980		
THESE REFINERS' PRODUCTION, BY SOURCE								
From Primary (ores & concentrates)	3,386,998	3.4	3.7	3.8	4.3	3.4		
From Coins	0	0.0	0.1	0.2	2.3	1.4		
From Old Scrap (used photo film & other products)	4,982,186	5.0	5.6	5.3	7.7	6.2		
From New Scrap (in-plant clippings, waste)*	2,032,327	2.0	2.5	2.3	3.0	2.8		
TOTAL PRODUCTION	10,401,511	10.4	11.9	11.7	17.4	13.9		
TOTAL PRODUCTION Less New Scrap*	8,369,184	8.4	9.4	9.4	14.3	11.1		
ABOVE TOTAL PRODUCTION, BY OWNERSHIP								
From Refiners' Own or Purchased Materials	7,527,336	7.5	8.4	8.3	11.2	9.2		
Refined on Toll for Others	2,874,175	2.9	3.5	3.4	6.2	4.7		
DISPOSITION BY THESE REFINERS								
Converted in Plant (consumed in fabricating, etc.)	2,794,582	2.8	3.6	3.4	5.7	4.9		
Shipped Out: Own materials	4,741,306	4.7	4.6	4.6	5.8	4.5		
Against Tolls	3,185,771	3.2	3.0	3.3	5.6	4.5		
TOTAL DISPOSITION	10,721,659	10.7	11.2	11.3	17.1	13.9		
TOTAL DISPOSITION Less New Scrap*	8,689,332	8.7	8.7	9.0	14.1	11.1		
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)			TOTAL FOR PERIOD					
			-320,148	-0.3	+0.7	+2.0	+1.3	-0.5
THESE REFINERS' STOCKS AT END OF PERIOD			3,125,296	3.1	3.4	3.1	2.8	1.1

Production and Disposition of 999 Silver Bars by All Known Refiners in Australia, Canada, Mexico, Peru, South Africa and Sweden; and some other Refiners in Europe and Asia.

	TROY OUNCES		MILLION TROY OUNCES			
	May 1981	May 1981	Apr 1981	Jan-May 1981	Jan-May 1980	Full Yr 1980
THESE REFINERS' PRODUCTION, BY SOURCE						
From Primary (ores & concentrates)	10,043,940	10.0	13.7	12.0	12.6	12.0
From Coins	19,002	0.0+	0.0+	0.1	0.1	0.1
From Old Scrap (used photo film & other products)	6,037,912	6.0	6.4	6.2	8.7	7.4
From New Scrap (in-plant clippings, waste)*	410,335	0.4	1.2	1.1	1.7	1.4
TOTAL PRODUCTION	16,511,189	16.5	21.3	19.4	23.1	21.0
TOTAL PRODUCTION Less New Scrap*	16,100,854	16.1	20.1	18.3	21.4	19.5
ABOVE TOTAL PRODUCTION, BY OWNERSHIP						
From Refiners' Own or Purchased Materials	13,662,221	13.7	18.4	16.1	18.8	17.2
Refined on Toll for Others	2,848,968	2.8	2.9	3.3	4.3	3.8
DISPOSITION BY THESE REFINERS						
Converted in Plant (consumed in fabricating, etc.)	4,669,637	4.7	6.1	5.5	9.0	7.0
Shipped Out: Own materials	10,479,861	10.5	10.8	10.8	10.4	10.4
Against Tolls	2,876,656	2.9	2.7	3.2	3.3	3.3
TOTAL DISPOSITION	18,026,154	18.0	19.7	19.5	22.6	20.8
TOTAL DISPOSITION Less New Scrap*	17,615,819	17.6	18.5	18.4	20.9	19.3
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)			TOTAL FOR PERIOD			
	-1,514,965	-1.5	+1.6	-0.3	+2.4	+2.3
THESE REFINERS' STOCKS AT END OF PERIOD	7,301,097	7.3	8.8	7.3	7.7	7.6

* PRODUCTION From New Scrap is 999 silver made from in-plant clippings, spillage, sweepings, etc., generated during manufacturing processes; since it is in continuous cycle from new scrap to 999 silver, to new scrap, some like to see the production and disposition totals after deducting the new scrap from both.

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INFORMATION ON SILVER FOR INDUSTRY

VOLUME XI, NUMBER 7

JULY-AUGUST, 1981

HIGH-PERFORMANCE SILVER-ZINC BATTERIES START AIRPLANES

The requirement for portable high-energy units for starting aircraft in remote areas, particularly in the less developed countries where it is not possible to equip remote airfields with power plants, is being met by conveniently sized silver-zinc batteries manufactured in India. Silver-zinc batteries made by **Simco Meters Limited**, 109 Nungambakkam High Road, Madras 600 034, Tamil Nadu, India, are designed to permit multiple assembly according to power needs.

Each silver-zinc battery of the type illustrated has a ten-minute discharge rate of 270 amperes at 1.27 volts. The 30 battery array shown can deliver over 10,000 watts over that period. The rechargeable batteries are fully portable and are internationally used in commercial and military aircraft for starting their engines in remote airfields.

The zinc-silver oxide battery has long been found to be ideal

where maximum energy per unit weight and volume of the battery is required. The silver oxide anodes are designed to deliver several full charge-discharge cycles without any appreciable deterioration during the life of the battery. The number of internal electrodes is chosen to meet the maximum current density to be delivered. When the useful life of the battery is spent, the silver oxide anodes designed by Simco may be used in other battery cells before it becomes necessary to reprocess the silver. Simco is also developing lithium-silver batteries. Its battery program is focused on versatility of application and reliability of high-density power supply.

Among the Silver Institute member companies which provide high quality refined silver for batteries and other industrial uses are

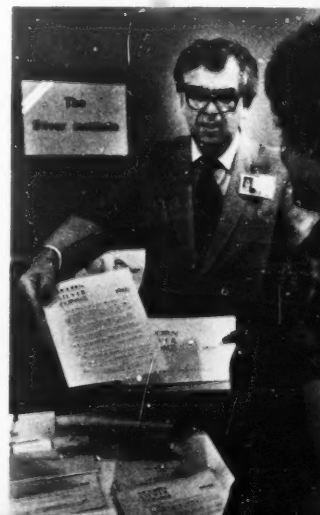
Lal Chand Vijay Kumar Jain, Sarafa Bazaar, Saharanpur and **Luxmi Traders**, 2 Exchange Place, Calcutta, in India.

SILVER INSTITUTE ATTENDS INTERNATIONAL COIN SHOW

This year's 90th Anniversary Convention of the **American Numismatic Association** was truly international in character. Held in the spacious Rivergate Convention Center of New Orleans, Louisiana, July 27 through August 2, an estimated 8,000 coin collectors from many nations visited the Convention's bourse to examine the thousands of ancient and modern coins displayed by some 400 of the world's most prestigious coin dealers.

And for the first time in the history of ANA conventions, coin collectors and dealers were able to better appreciate the beauty and significance of modern coinage by visiting the exhibits of several mints and governments, and the Silver Institute, composed of 156 members that produce silver and silver products in 25 nations. The new and unique book, **Modern Silver Coinage—1980**, was displayed at the Silver Institute booth, managed by David U. Groves (shown at right) of the Silver Institute staff. Hundreds of visitors and coin dealers received information about **Modern Silver Coinage—1980**, the Silver Ingot Mark book, and other publications, as well as copies of Institute newsletters and other reports. **Modern Silver Coinage—1980 is available for only \$10 per copy, including postage, from The Silver Institute.**

Coinciding with the July 29 Royal Wedding of His Royal Highness Charles, Prince of Wales, and Lady Diana Spencer, the British Royal Mint's exhibit highlighted coinage struck to honor the wedding. A continuing flow of persons visited this popular exhibit to buy Great Britain's **Royal Wedding Silver Proof Crown**



(pictured at right) which is the first ever for a British Royal marriage and was designed by Philip Nathan, a former Mint engraver. Only 250,000 coins were struck as silver proofs for worldwide distribution. With a diameter of 38.61 millimeters and a weight of 28.28 grams, each proof coin was struck from specially polished dies to achieve a mirror-like finish, and relief designs are frosted, to contrast with the polished background. This sterling silver coin features profile portraits of Prince Charles and Lady Diana on the reverse along with a portrait of Queen Elizabeth II on the obverse. Similar .925 silver proof crowns are being issued by Bermuda, Jamaica, Bahamas, St. Helena, Gibraltar, Guernsey, Jersey, Tuvalu, Mauritius, Tristan da Cunha, Falkland Islands, Turks and Caicos Islands, Ascension Islands and Cayman Islands. Additional information about these and other coins, may be obtained from the **British Royal Mint**, 128 Passaic Avenue, Fairfield, N.J. 07006, or from the **Royal Mint**, Numismatic Bureau, Llantrisant, Pontyclun, Mid-Glamorgan, CF7 8YT, Great Britain.



Further stimulating interest in today's coinage and metal arts were the educational and beautiful exhibits of the **Royal Canadian Mint**, 355 River Road, Vanier, Ontario, Canada K1A 0G8 with a marvelous, compact display of the minting process: **The Metal Arts Company**, 230 Park Avenue, New York, N.Y. 10017 showing its artistic and finely crafted medals and 925 fine silver **Sunshine** bullion pieces; the **U.S. Mint** with Director of the Mint, Mrs. Donna Pope, signing autographs and talking with visitors; the **U.S. Bureau of Engraving and Printing**; the **Banco de Mexico**; the **Paris Mint** of France; the **Singapore Mint**; the **Franklin Mint** and the Food and Agriculture Organization (FAO) of the United Nations.

One of the many visitors is shown a master sculptured model by (l. to r.) Betsy Baldwin, I.M. Urbach and Catherine Roberts of Metal Arts Co.

Staffing the British Royal Mint's exhibit, (l. to r.): Bett Fernandez, Scott D. Schneider, Kenneth W. Roman, D. Martin Jones and John Van Emden.



NEW MEMBERS WELCOMED

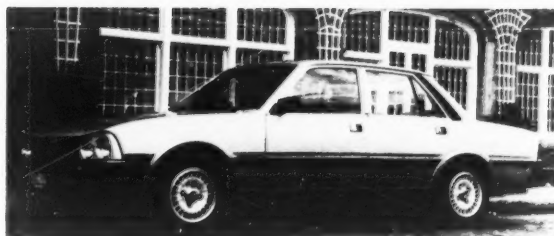
The Silver Institute warmly welcomes to membership **MAPCO Minerals Corporation**, 1667 Cole Boulevard, Building 19, Golden, Colorado 80401 with its Senior Vice President, William C. Cole, serving as the Official Representative in Institute business; **McLemore Metals Inc.**, 507 S. Mobberly Avenue, P.O. Box 3725, Longview, Texas 75606, represented in Institute matters by President B. Reagan McLemore, III; and **Bache Halsey Stuart Metal Co., Inc.**, 100 Gold Street, New York, N.Y. 10038 with Senior Vice President Stanley Steinberg representing the company in Institute affairs.

SILVER TIPPED SPARK PLUGS GO A LONG WAY

Whether accelerating up a steep hill, idling in inner-city traffic, or cruising non-stop for hundreds of miles, motorcycles with engines using the new **Bosch Silver Sport** spark plugs last longer and misfire less; outperforming plugs with copper, nickel or even gold electrodes. The Silver Sport spark plugs are designed to function more efficiently in engines with high rpms.

The secret of the plugs is found in the electrodes which are designed with pure silver tips. Silver's magic is its heat conductivity. No other metal used in spark plug electrodes today can match silver for conducting heat, and this allows the **Robert Bosch Corp.**, 2800 South 25th Avenue, Broadview, Illinois 60153 to shape the silver tip much thinner than tips in standard plugs. When it comes to electrodes, thinner is better. The thinner electrodes let Bosch build a longer insulator with a larger scavenging area. The spark plug is, therefore, less likely to misfire. The thin silver electrodes need

less firing voltage to function, and this slows physical erosion of the silver tip. Silver is also more resistant to chemical corrosion than standard plug materials. The dual benefits of less chemical corrosion and less physical erosion mean a longer lasting spark plug. The Bosch Silver Sport spark plugs are brand new and are recommended for motorcycles, snowmobiles and other engines designed for high rpms.



Bosch spreads silver's magic to the automobile industry as well, with its Automotive Silver spark plug. This innovation hit the European market in 1979, and by 1980 all Peugeot, BMW, Volvo, Audi and Renault models were equipped with the silver tipped plugs. Peugeot recommends that the owners of **Peugeot** cars (such as the one pictured above) have a checkup on the spark plugs only every 30,000 miles, which is almost *twice* the recommended duration for their former plugs. The bottom line for the automobile industry is that no spark plug lasts longer and functions more efficiently than plugs with silver tipped electrodes.

NEW SILVER DEVELOPMENTS

The July 1981 quarterly issue of **NEW SILVER TECHNOLOGY** (annual subscription price \$30) shows a steadily increasing development of silver applications. Among these are the following:

- Primary batteries activated by seawater for exploration and life support systems under water have been developed by M. Hiroi, **Kobe University of Mercantile Marine**, Fukae-Minami, Higashinada, Kobe 658, Japan. Batteries made with silver chloride and magnesium metal were found to operate even more efficiently at increased depths where the pressure is over 700 pounds per square inch.
- The superior thermal conductivity of silver is utilized in new super-abrasive grinding wheels developed by R. H. Sioui, Carbide Diamond Products Div., **Norton Company**, 1 New Bond Street, Worcester, Mass. 01606. Because excessive heat causes accelerated wear, silver as a heat dissipater is incorporated with a lubricating resin or graphite to reduce friction. The combination results in improved grinding performance and a considerable reduction in chipping of the edges of the grinding wheel.
- Extremely flexible electrical conductors can be made by applying a metallic silver coating to nylon and other synthetic threads and natural fibers by a process described in U.S. Patent 4,247,596 issued to Tin B. Yee, 719 Erskine St., N.W., Huntsville, Alabama 35805 for the **U.S. Government**. The silver coated fibers can be reliably bonded to terminals with a silver-containing epoxy resin adhesive and withstand even the heavy vibration conditions of spacecraft launch.
- An improved corrosion-resistant silver dental alloy is announced in U.S. Patent 4,234,339, issued to **Engelhard Industries**, 70 Wood Avenue South, Metro Park Plaza, Iselin, N.J. 08830. The new alloy provides both improved corrosion resistance and good handling characteristics, which are a result of particle size control. The silver, tin, and copper alloys are prepared in elliptical, irregular, and flake-like particles which produce an amalgam superior to the conventional alloys using spherical alloy powders.
- A thin flexible laminate of glass, silver, and steel is a desirable solar reflector material developed by R. H. Marion, **Sandia Laboratories**, Albuquerque, New Mexico 87185. Utilizing Flexible Corning Microsheet glass a quarter of a millimeter thick coated with silver and then copper, and bonded to three quarter millimeter thick steel sheet, the laminate resists fracture from sun-induced heat shock. The strength and flexibility of the laminate also withstands hailstones as large as one inch in diameter without damage.
- The antibacterial properties of silver have been incorporated into a new device described in German Patent 2,919,315 issued to **Horst Störk**, 7201 Emmingen-Liptingen 1, West Germany. The device is used to purify ordinary tap water to a quality suitable for use in kidney dialysis machines and other medical and industrial applications where high purity water is required. The active element of the machine is an ion exchanger consisting of silver-containing polymers. This element has a useful life of 6 to 8 years.

LATEST SILVER INSTITUTE REFINING STATISTICS

Production and Disposition of **999 Silver Bars** by All Known Refiners in the United States

	TROY OUNCES		MILLION TROY OUNCES			
	July 1981	Jul 1981	Jun 1981	Jan-Jul 1981	Jan-Jul 1980	Full Yr 1980
THESE REFINERS' PRODUCTION, BY SOURCE						
	<i>MONTHLY RATE</i>					
From Primary (ores & concentrates)	3,677,120	3.7	3.8	3.8	3.8	3.4
From Coins	194,910	0.2	0.0+	0.2	1.9	1.4
From Old Scrap (used photo film & other products)	4,127,092	4.1	5.0	5.1	6.9	6.2
From New Scrap (in-plant clippings, waste)*	2,433,550	2.4	2.6	2.4	2.8	2.8
TOTAL PRODUCTION	10,432,672	10.4	11.5	11.5	15.5	13.9
TOTAL PRODUCTION Less New Scrap*	7,999,122	8.0	8.9	9.1	12.7	11.1
ABOVE TOTAL PRODUCTION, BY OWNERSHIP						
From Refiners' Own or Purchased Materials	8,059,857	8.1	8.7	8.3	9.9	9.2
Refined on Toll for Others	2,372,815	2.4	2.8	3.2	5.5	4.7
DISPOSITION BY THESE REFINERS						
Converted in Plant (consumed in fabricating, etc.)	2,839,551	2.8	3.6	3.4	5.0	4.9
Shipped Out: Own materials	6,436,953	6.4	5.6	5.0	5.3	4.5
Against Tolls	2,333,181	2.3	2.0	2.9	5.2	4.5
TOTAL DISPOSITION	11,609,685	11.6	11.2	11.3	15.5	13.9
TOTAL DISPOSITION Less New Scrap*	9,176,135	9.2	8.5	9.0	12.7	11.1
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)						
	-1,177,013	-1.2	+0.4	+1.2	-0.4	-0.5
THESE REFINERS' STOCKS AT END OF PERIOD	2,300,800	2.3	3.5	2.3	1.2	1.1

Production and Disposition of **999 Silver Bars** by All Known Refiners in Australia, Canada, Mexico, Peru, South Africa and Sweden; and some other Refiners in Europe and Asia.

	TROY OUNCES		MILLION TROY OUNCES			
	July 1981	Jul 1981	Jun 1981	Jan-Jul 1981	Jan-Jul 1980	Full Yr 1980
THESE REFINERS' PRODUCTION, BY SOURCE						
	<i>MONTHLY RATE</i>					
From Primary (ores & concentrates)	12,366,432	12.4	12.1	12.1	12.4	12.0
From Coins	0	0.0	0.0	0.1	0.1	0.1
From Old Scrap (used photo film & other products)	3,280,395	3.3	4.9	5.6	7.9	7.4
From New Scrap (in-plant clippings, waste)*	657,067	0.7	1.0	1.0	1.5	1.4
TOTAL PRODUCTION	16,303,894	16.3	18.0	18.8	21.9	21.0
TOTAL PRODUCTION Less New Scrap*	15,646,827	15.6	17.0	17.8	20.4	19.5
ABOVE TOTAL PRODUCTION, BY OWNERSHIP						
From Refiners' Own or Purchased Materials	14,151,376	14.2	15.0	15.7	17.8	17.2
Refined on Toll for Others	2,152,518	2.2	3.0	3.1	4.0	3.8
DISPOSITION BY THESE REFINERS						
Converted in Plant (consumed in fabricating, etc.)	3,344,451	3.3	4.3	5.0	7.9	7.0
Shipped Out: Own materials	10,478,388	10.5	11.5	10.8	10.4	10.4
Against Tolls	2,150,823	2.2	2.9	3.0	3.3	3.3
TOTAL DISPOSITION	15,973,662	16.0	18.8	18.9	21.6	20.8
TOTAL DISPOSITION Less New Scrap*	15,316,595	15.3	17.8	17.9	20.1	19.3
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)						
	+330,232	+0.3	-0.8	-0.8	+2.1	+2.3
THESE REFINERS' STOCKS AT END OF PERIOD	6,872,145	6.9	6.5	6.9	7.5	7.6

* PRODUCTION From New Scrap is 999 silver made from in-plant clippings, spillage, sweepings, etc., generated during manufacturing processes; since it is in continuous cycle from new scrap to 999 silver, to new scrap, some like to see the production and disposition totals after deducting the new scrap from both.

THE SILVER INSTITUTE

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THE SILVER INSTITUTE LETTER

INFORMATION ON SILVER FOR INDUSTRY

VOLUME XI NUMBER 9

SEPTEMBER 1981

ADVANCED DESIGN
HELIOSTATS DEVELOPED

Silvered glass used to convert the sun's rays to electric power is the star performer at the Second-Generation Heliostat Workshop opening September 30, in Albuquerque, New Mexico. Operated by the Sandia Corporation, for the U.S. Department of Energy, the workshop will be attended by over 25 companies interested in constructing large scale solar power plants, including Southern

California Edison, Arizona Electric Power, Nevada Power Co., Texas-Electric Service Co., Colorado-Utah Electric Association, Hawaii Electric Co., and a delegation from Israel.

The Sandia facility, described in The Silver Letter of May 1977, has become a major center for mirror technology. Silver itself is the best reflector, with an average solar reflectance of 98 percent. This value cannot be entirely achieved because silver must be applied behind glass. New smooth float-glass 0.1 millimeter thick achieves a reflectance of 94 to 95 percent. However, the major concern of the Workshop is performance. Some mirrors have developed dark spots. Research to eliminate this problem has been closely followed by the Silver Institute staff since 1975 in **New Silver Technology**. The solution to flat mirror spotting will be reported at this meeting. It is the use of automobile windshield technology. The silvered back of the glass, after a protective coating is applied, is coated with a polyvinyl butyrate resin and then covered with glass, autoclaved to produce a laminate that has so far withstood degradation for five years. Second-generation heliostats are made by The Boeing Company (as pictured above left), Northrop Corp., McDonnell Douglas Corp., and Martin-Marietta Corp., each of which are tested and demonstrated at Albuquerque.

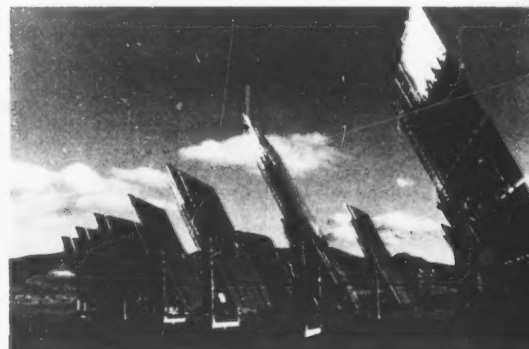
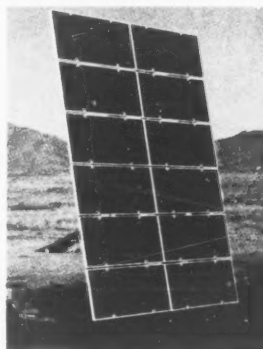
The Sandia Corporation is responsible for two types of reflectors. The one pictured above right used to heat liquids to 1000 F. The other a trough type to heat liquids to 700 F. Troughs require curved mirrors. One solution is to laminate the silvered glass with a thin steel sheet, as detailed on page 22 of the July 1981 issue of New Silver Technology.

BÉLA BARTÓK, YURY GAGARIN, AND POPE JOHN PAUL II PORTRAYED ON
SILVER COINS OF 1981

Although the Machin portrait of Queen Elizabeth II will be shown on more different 1981 coins than the portraits of any other person, many other fascinating personages of historical or current significance are featured on the sparkling silver coins of 1981. For those who love music, Hungary has issued the 500 Forint legal tender **silver coin**, shown at right, honoring **Béla Bartók** who was acclaimed by the famous violinist Yehudi Menuhin as the greatest composer of our age.

The obverse of this coin shows Bartók in profile, wearing a hat, against a map of the world, symbolizing the international appeal of his work, while the reverse features the opening bars of Bartók's "Allegro Barbaro". This coin is 64 percent pure silver, weighs 25 grams and measures 40 mm in diameter. Additional information may be obtained from **Paramount Coin Corporation**, One Paramount Plaza, Englewood, Ohio 45322.

For space enthusiasts, for the first time, a nation has issued a coin to commemorate the 20th anniversary of the first manned space flight by Russian,



Yury Alekseyevich Gagarin. Czechoslovakia recently minted a 50 percent pure silver legal tender coin, which was placed on sale at all branches of the Czechoslovakian State Bank, with a face value of 100 korun, which measures 29 mm in diameter and weighs 9 grams. This coin pictures Gagarin in his space helmet and a stylistic track of a rocket. Orders may be placed through **Artia**, ve Smekach 30, P.O. Box 790, 111 27 Prague 1, Czechoslovakia.

Pope John Paul II is portrayed on the obverse of an 835 fine silver 500 lire coin issued this year by the Vatican City. The reverse of this coin bears the Polish-style arms assumed by the pontiff. This attractive silver coin measures 29 mm in diameter and weighs 11 grams, and can be purchased from the *Governatorato, Segreteria Generale, Ufficio Filatelico-Numismatico, 00120 Citta del Vaticano*, Vatican City, Europe.

And for numismatists, and just plain coin collectors, who love coins of ancient times, San Marino has struck three coins commemorating the **2,000th anniversary of the death of the famous ancient poet, Virgil**, and depicting scenes from his many poems. Two different 835 fine silver 500 lire coins, measuring 29 mm in diameter and each weighing 11 grams depict a flute player of 2,000 years ago, seated under a tree playing his flute and the second coin shows a farmer of the same period, sowing seeds. The third legal tender coin in this set is a 1,000 lire coin of 835 fine silver, which weighs 14.6 grams and measures 31.3 mm in diameter, and shows a dramatic figure of a mounted soldier with Roman armor and a Greek styled helmet being crowned with a laurel wreath. This set of coins may be obtained from **The Numismatic Studio**, P.O. Box 747, Westbury, N.Y. 11590.

Of current significance, the **East Caribbean Currency Authority (ECCA)**, comprising seven territories in the West Indies, has issued a \$10 legal tender 925 fine silver proof coin, commemorating the 10th anniversary of the Caribbean Development Bank. The chief aim of ECCA is to provide a common currency for Anguilla, Antigua-Montserrat, Dominica, Grenada, St. Kitts-Nevis, St. Lucia and St. Vincent.

The reverse of this silver proof coin (*pictured at right*) depicts Sir Francis Drake's famous sailing ship, "The Golden Hind". Each silver proof coin weighs 28.28 grams and measures 38.61 mm in diameter. Only 10,000 have been struck for worldwide distribution. For ordering information, write to the **British Royal Mint**, 128 Passaic Avenue, Fairfield, New Jersey 07006.

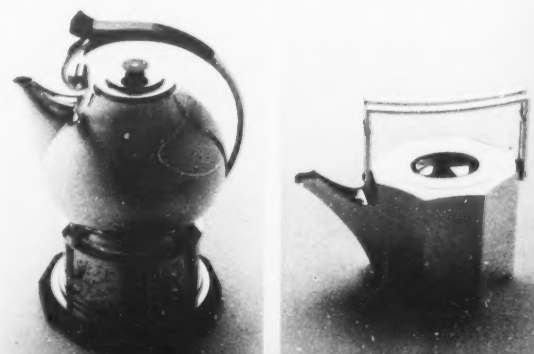


DENMARK, SWEDEN, U.S.—THE FOCUS IS SILVER

During the past year, the Danish firm of silversmiths, **Hans Hansen Sølvsmiede A/S**, Platinvej 29, 6000 Kolding, Demark has celebrated the internationally famous Karl Gustav Hansen's 50 years as an active silversmith through exhibits of his work. The pictured teapot with chafing dish is his final apprenticeship test-piece made in 1934, for which he was awarded a silver medal. Since then, a veritable treasure-trove of coffee-pots, teapots, jugs, forks, spoons and jewelry has been created by his gifted fingers. The other photograph shows one of his latest works—a coffee/teapot in sterling silver, made 45 years after that early test piece.

Confirming the international appreciation of silver as an art form, from October 1 through October 31, two of Sweden's leading silversmiths, Jan Lundgren and Kristian Nilsson, will be featured in a "**Swedish Art in Silver**" show at the **American-Scandinavian Foundation**, 127 East 73rd Street, New York, N.Y. 10021. Each silversmith represents a different approach to contemporary Swedish silver design. Jan Lundgren takes a traditional route in his "living" objects of art which merge clean angles and surfaces with the reflective quality of silver, making silver what he calls "a living art form". His work is included in the National Museum of Stockholm and was chosen to travel to Moscow as a representative example of contemporary Swedish design by King Carl XVI Gustaf of Sweden.

A more playful approach to the expressive nature of silver is taken by Kristian Nilsson, who works with shapes and decorations that attack the accepted conventions of this precious metal. A flask shaped as a hibiscus flower, or a cake-slicer in the



shape of a peacock reflect a touch of fantasy that he also includes in his jewelry. Organized by the Society for Contemporary Swedish Silver, this exhibit will be on display in the **Swedish Historical Museum** in Philadelphia in November.

November will also mark the unveiling of hundreds of beautiful sterling silver holloware and flatware products in an atmosphere of elegance and decor at the Wallace Silver showroom at the New York Merchandise Mart at 41 Madison Avenue. Rooms, such as the main showroom, pictured at right, create a traditional and fitting setting for a company which prides itself in 146 years of quality and excellence in the manufacture of fine silver. The showrooms of **Wallace Silversmiths**, Wallingford, Conn. 06410 at the NY Merchandise Mart is open to jewelers, department store buyers and other members of the trade from November 8th through November 13th. Later on, the public will



have a chance to admire these fine sterling silver products of Wallace Silversmiths, as well as those of many other firms, at their convenience in the local stores that handle fine sterling silverware.

WELCOME TO NEW SILVER INSTITUTE MEMBERS

Welcomed to membership in The Silver Institute are **Empresa Minera de Mantos Blancos, S.A.**, Casilla 570, Antofagasta, Chile, represented in Institute affairs by Mr. B. A. Reijnt, and **Environmental Reclamation Company, Inc., TMW Corporation Division**, 825 Schoenhaar Drive, West Bend, Wisconsin 53095 with its President, Gunter Woog, serving as its Official Representative in The Silver Institute.

MOTION PICTURE "SILVER" AVAILABLE

Three hundred prints of the new, 28-minute, sound-and-color motion picture, "Silver" have been donated to the U.S. Bureau of Mines by The Silver Institute. Schools, civic and business groups, and other groups may obtain a free-loan copy by writing to Motion Pictures, U.S. Bureau of Mines, 4800 Forbes Avenue, Pittsburgh, PA 15213.

REFINED SILVER PRODUCTION DECREASES

Central to the entire silver industry, from the miners of ores and the finders of scrap, to the millions who use finished products made with silver, are **the silver refiners**. They take the wide variety of silver-containing materials and meticulously produce the millions of ounces of silver metal of at least 99.9% purity from which are made the many silver products which are essential and valuable in our daily lives.

Ten years ago, silver industry leaders, including now President Alex Schmidt-Fellner and other current officers of The Silver Institute, initiated the program by which the Institute provides precise and timely silver refining reports every month. This is done with the cooperation of all the known U.S. refiners and of many leading refiners in other countries, who send to The Silver Institute via the American Bureau of Metal Statistics, their own confidential figures so that a set of U.S. totals and a set of Non-U.S. totals may be promptly reported on the fourth page of The Silver Institute Letter. This timely information is helpful not only to the refiners themselves, but to all who produce, use or trade in silver and silver products.

For example, it is interesting to compare the monthly rates of production of January-August 1981 with those of January-August 1980. While the production of refined silver from ores and concentrates this year was just under that for last year, the refined silver production from coins, old scrap and new scrap decreased by 32% in the U.S. and decreased by 29% in the Non-U.S. group. As a result, the rate of total production of refined silver decreased by 25% in the U.S. and decreased by 13% in the Non-U.S. group.

It is also seen that the stocks of refined silver in the hands of U.S. refiners are equivalent to only 7 days of production and that the refiners in the Non-U.S. group have stocks equivalent to only 10 days of production.

LATEST SILVER INSTITUTE REFINING STATISTICS

Production and Disposition of **999 Silver Bars** by All Known Refiners in the United States

	TROY OUNCES		MILLION TROY OUNCES			
	August 1981	Aug 1981	Jul 1981	Jan-Aug 1981	Jan-Aug 1980	Full Yr 1980
THESE REFINERS' PRODUCTION, BY SOURCE						
			MONTHLY RATE			
From Primary (ores & concentrates)	3,945,980	3.9	3.7	3.8	3.8	3.4
From Coins	67,862	0.1	0.2	0.2	1.8	1.4
From Old Scrap (used photo film & other products)	4,143,460	4.1	4.1	5.0	6.7	6.2
From New Scrap (in-plant clippings, waste)*	1,956,527	2.0	2.4	2.3	2.6	2.8
TOTAL PRODUCTION	10,113,829	10.1	10.4	11.3	15.0	13.9
TOTAL PRODUCTION Less New Scrap*	8,157,302	8.2	8.0	9.0	12.3	11.1
ABOVE TOTAL PRODUCTION, BY OWNERSHIP						
From Refiners' Own or Purchased Materials	8,072,290	8.1	8.1	8.3	9.6	9.2
Refined on Toll for Others	2,041,539	2.0	2.4	3.0	5.4	4.7
DISPOSITION BY THESE REFINERS						
Converted in Plant (consumed in fabricating, etc.)	3,129,515	3.1	2.8	3.3	4.8	4.9
Shipped Out: Own materials	4,662,448	4.7	6.4	5.0	5.0	4.5
Against Tolls	2,010,822	2.0	2.3	2.8	5.2	4.5
TOTAL DISPOSITION	9,802,785	9.8	11.6	11.1	15.0	13.9
TOTAL DISPOSITION Less New Scrap*	7,846,258	7.8	9.2	8.8	12.3	11.1
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)			TOTAL FOR PERIOD			
	+ 311,044	+ 0.3	- 1.2	+ 1.5	- 0.0	+ - 0.5
THESE REFINERS' STOCKS AT END OF PERIOD	2,611,844	2.6	2.3	2.6	1.6	1.1

Production and Disposition of **999 Silver Bars** by All Known Refiners in Australia, Canada, Mexico, Peru, South Africa and Sweden; and some other Refiners in Europe and Asia.

	TROY OUNCES		MILLION TROY OUNCES			
	August 1981	Aug 1981	Jul 1981	Jan-Aug 1981	Jan-Aug 1980	Full Yr 1980
THESE REFINERS' PRODUCTION, BY SOURCE						
			MONTHLY RATE			
From Primary (ores & concentrates)	11,735,030	11.7	12.4	12.0	12.1	12.0
From Coins	0	0.0	0.0	0.1	0.1	0.1
From Old Scrap (used photo film & other products)	4,996,693	5.0	3.3	5.5	7.8	7.4
From New Scrap (in-plant clippings, waste)*	857,799	0.9	0.7	1.0	1.4	1.4
TOTAL PRODUCTION	17,589,522	17.6	16.3	18.6	21.5	21.0
TOTAL PRODUCTION Less New Scrap*	16,731,723	16.7	15.6	17.6	20.0	19.5
ABOVE TOTAL PRODUCTION, BY OWNERSHIP						
From Refiners' Own or Purchased Materials	15,444,998	15.4	14.2	15.7	17.5	17.2
Refined on Toll for Others	2,144,524	2.1	2.2	2.9	4.0	3.8
DISPOSITION BY THESE REFINERS						
Converted in Plant (consumed in fabricating, etc.)	4,803,471	4.8	3.3	5.0	7.6	7.0
Shipped Out: Own materials	11,426,752	11.4	10.5	10.9	10.3	10.4
Against Tolls	1,961,291	2.0	2.2	2.9	3.3	3.3
TOTAL DISPOSITION	18,191,514	18.2	16.0	18.8	21.2	20.8
TOTAL DISPOSITION Less New Scrap*	17,333,715	17.3	15.3	17.8	19.8	19.3
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)			TOTAL FOR PERIOD			
	- 601,992	- 0.6	+ 0.3	- 1.4	+ 2.1	+ 2.3
THESE REFINERS' STOCKS AT END OF PERIOD	6,270,153	6.3	6.9	6.3	7.4	7.6

* PRODUCTION From New Scrap is 999 silver made from in-plant clippings, spillage, sweepings, etc., generated during manufacturing processes; since it is in continuous cycle from new scrap to 999 silver, to new scrap, some like to see the production and disposition totals after deducting the new scrap from both.

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THE SILVER INSTITUTE LETTER

INFORMATION ON SILVER FOR INDUSTRY

VOLUME XI NUMBER 10

OCTOBER 1981

SILVER MAKES ALLOYS TOUGH

Aluminum, magnesium, copper, lead, and tin benefit from the addition of silver. **The inclusion of silver in aluminum alloys in an amount of only 0.5% results in the strongest aluminum casting alloy yet discovered.** A few years ago, metallurgists found that this small addition of silver resulted in an enormous improvement in performance.

A major application of this alloy is in the Trident I missile (*shown at right*) wherein 29 aluminum-silver alloy castings are used. Research conducted at the Northrup Corporation, Hawthorne, California shows that the silver forms a strong intergranular composition that reduces the brittleness of the cast aluminum alloy. This results in a markedly increased toughness as shown in the graph *below right*.

Now further investigations underwritten by the U.S. Naval Air Systems Command, reported in the October 1981 issue of NEW SILVER TECHNOLOGY, show that by simply pressurizing a heated casting of the aluminum-silver alloy (A201-T7) with an inert gas, gives the casting reliable strength to the same degree of similar parts produced from conventional aluminum alloys by expensive forging and machining. **This has opened the potential for advantageous use of the aluminum-silver alloy throughout the aircraft and other industries.**

Magnesium Electron Ltd., Winchester, England now includes 2.5% silver in its magnesium alloy for gear cases of the new jet engines which must stand long exposure at high temperatures.

Inclusion of silver also has remarkable effects on copper. The Copper Development Association, 405 Lexington Ave., New York, N.Y., 10017 administers specifications on 14 different copper alloys which contain 8 to 30 troy ounces of silver per ton. **With silver the copper performs at high temperatures, remaining tough even in reducing atmospheres, resisting both softening and embrittlement.** The copper-silver alloy also is easily bonded for applications throughout the electrical and electronic industries.

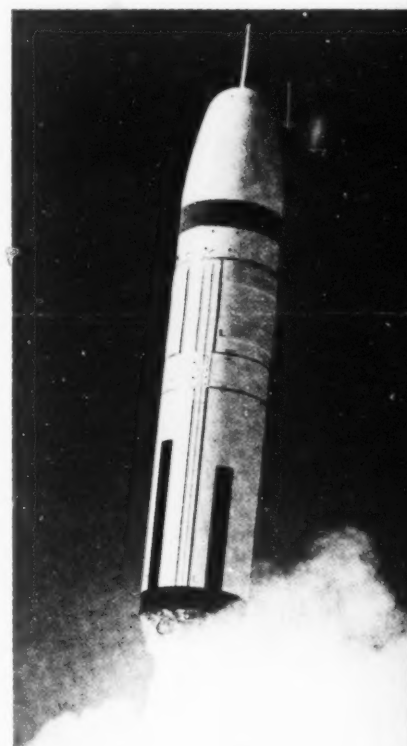
For assembling copper tubing **household water supply systems, solar heating systems** and many types of household and industrial equipment where low temperature soldering must produce tough and perfect joints, solder containing 5% silver in tin gives maximum performance with minimum labor of application.

Also, the **radiators** of the new model automobiles must withstand higher driving temperatures and pressures. To meet these conditions the manufacturers include **0.5% silver in the lead solder so that it maintains its perfect seal and toughness.**

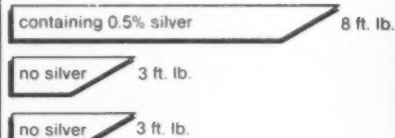
SILVER LEADERS FROM FIVE CONTINENTS MEET

Leaders of the silver industry from Asia, Australia, Europe, North America and South America met at a Silver Institute luncheon meeting on Wednesday, September 30th in Denver, Colorado. Added to the Board of Directors were Setsuo Takashima of Mitsui Mining & Smelting Co., Ltd., Japan; Kent D. Hoffman of Texasgulf Metals Co., Canada; and David E. P. Lindh of Coeur d'Alene Mines Corporation, Idaho.

With Institute Chairman Bernhard Rohe of Industrias Peñoles, S.A. presiding, the Board reviewed the current work of the Institute in extending the beneficial uses of silver and silver

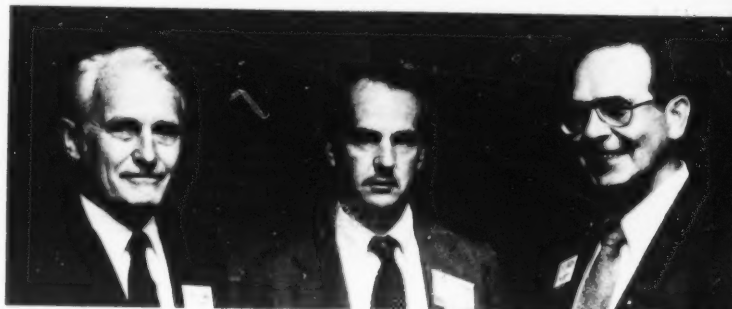


Toughness of Aluminum Alloys in foot-pound impact strength





Among those attending the Meeting. Above, (l. to r.) Silver Institute Chairman Bernhard Rohe of Peñoles, Institute President Alex Schmidt-Fellner of AMAX; Regional Vice Presidents for Western U.S., George Kent of Bunker Hill; for South America, Ernesto Baertl of Minas Arcata; for Mexico and Central America, Enrique Ibarra of Real de Monte y Pachuca; for Australia and Asia, Seiichi Ohtsuki, representing Yoshihiro Inai of Mitsubishi Metal. Present but not pictured here: for Eastern U.S., Francis Curren of Pease & Curren, and for Canada, Kenneth A. Laidman of Engelhard Ltd.

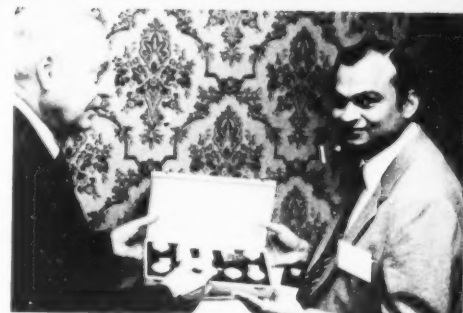


Above (l. to r.) Peter C. Barnett of North Broken Hill, Australia; Y. Shibuya of Nippon Mining, Japan; Paul Jeanty of Samuel Montagu, Great Britain; Charles F. Barber, Richard deJ. Osborne and James C. Buck of ASARCO.



Left (l. to r.) David Lindh of Coeur d'Alene Mines, Idaho; Kent D. Hoffman of Texasgulf Metals Canada.

At right, Felix Freeman of J. Aron (left) admires the new silver electrical products made by S.G. Daga (right) of Luxmi Traders, India.



products, and in providing precise and timely statistics on silver. Institute President Alex Schmidt-Fellner of AMAX Inc., led the discussion of plans for carrying out these and other important activities of The Silver Institute in the forthcoming months, as proposed by Anthony M.B. Hart of Johnson Matthey Ltd., Philip M. Lindstrom of Hecla Mining Co. and George C. Havener of ASARCO Inc., Chairmen of the Institute's Market Development, Publications and Statistics Committees.

AUSTRALIA'S STERLING SILVER ROYAL WEDDING GIFT

Prince Charles and Lady Diana recently received, as a wedding gift from Australia's government, the handsome set of **twenty solid sterling silver platters** in a French-polished wooden case, decorated with hand-made silver fittings, as shown at right. Commissioned to make this gift was the famous Australian silversmith, **Hendrick Forster**, 25 Portland Place, South Yarra 3141, Australia.

Mr. Forster says that each of the 20 platters contain well over a pound of silver that originally came from **Broken Hill Associated Smelters**, and was later converted into sheet silver by **Johnson Matthey Pty.** About 1,000 skilled-craftsmen man hours were used in the creation of this beautiful gift.

The lid of the wooden presentation case has an inlaid silver plaque with the following words engraved, "Presented to His Royal Highness, the Prince of Wales and the Lady Diana Spencer by the Commonwealth Government on behalf of the People of Australia on the occasion of their Marriage, 29 July 1981."



ENORMOUS INCREASE IN SILVER COIN ISSUING COUNTRIES IN PAST DECADE

Since The Silver Institute began working with the world's monetary authorities in 1971, by providing technical assistance in connection with the minting of silver coinages, **the number of nations that issue silver legal tender coins has grown from 34 in 1970 to 84 countries in 1980.**

Among the nations that have contributed to this surge in the number of silver coinages are some of the largest and the smallest nations in the world—Canada, the People's Republic of China, Bhutan, the Soviet Union, Fiji, Great Britain, Lesotho, Mexico and Sweden, just to name a few of the fifty countries that issued silver coinages in 1980 but did not issue silver coins in 1970.

The themes used in creation of silver commemorative coins have been as varied as are the backgrounds, cultures, traditions and personages of the issuing nations. But **Silver Institute studies would indicate that the silver coins that have gained widest popularity** have included coins commemorating the Olympic Games or other international athletic events; conservation of flora and fauna; the birth or death anniversary of a person of international importance; attractive renderings of local tourist attractions; and causes, symbols, or events that transcend national boundaries.

On one hand, there is Singapore's large, 40.7 mm in diameter (well over an inch and a half) and weighing a full troy ounce, 50 Dollar silver coin, which calls attention to Singapore's role as a financial center by showing currency symbols for the dollar, franc, yen, mark, and the pound. *Shown above*, this coin's popularity—based on international financial symbolism—was sufficient to justify its reissue this year. On the other hand, other coins, such as those honoring the 80th birthday of Queen Elizabeth, the Queen Mother of Great Britain, were minted by several nations and enjoyed demand by collectors in many other nations, but because of the nature of the theme, it is probable that these coins will never be reissued.

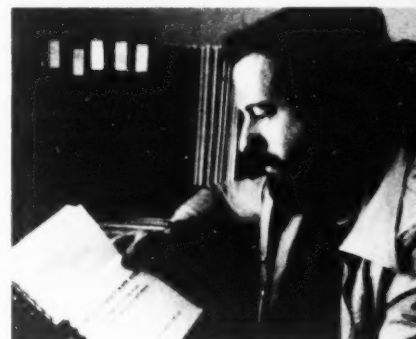


Already in 1981, at least a dozen countries have issued silver coins which did not mint silver coins in the previous year. Some nations are honoring the British Royal Wedding of Prince Charles and Lady Diana with beautiful sterling silver coins while others, like the Republic of Seychelles are minting sterling silver coins dedicated to other themes such as the coin, *shown at left*, which Seychelles recently issued as part of the UNICEF International Year of the Child Proof Coin Collection. Additional information about this coin featuring children of Seychelles dancing the traditional "centre-dance", with

a *coco de mert* tree in the background, may be obtained from **Paramount Coin Corporation**, One Englewood Plaza, Englewood, Ohio 45322. And for the Silver Institute's latest edition of its uniquely detailed book, **MODERN SILVER COINAGE-1980**, it is available from the Institute for only \$10 per copy, including postage.

ANOTHER NEW MEMBER WELCOMED

The Silver Institute welcomes to membership, **Korkos Precious Metals, Inc.**, P.O. Box 1305, College Station, Fredericksburg, VA 22402, represented in Institute matters by its President, John S. Korkos, shown at right in a visit to The Silver Institute office.



SEPTEMBER SEES SOME RECOVERY IN SILVER REFINERS' ACTIVITIES

As shown by the totals on the next page, the disposition of 999 silver by fabricating it in refiners' plants and by shipping it out to others, increased for U.S. refiners from 9.8 million troy ounces in August, to 10.6 million troy ounces in September. The corresponding disposition figures for Non-U.S. participating refiners showed an increase from 18.2 in August to 18.7 in September. The stocks in the hands of U.S. refiners remained at 2.6 million troy ounces (about 7 days supply), and the Non-U.S. participating refiners' stocks declined to 5.3 million troy ounces (about 9 days supply).

LATEST SILVER INSTITUTE REFINING STATISTICS

Production and Disposition of **999 Silver Bars** by All Known Refiners in the United States

	TROY OUNCES		MILLION TROY OUNCES			
	September 1981	Sep 1981	Aug 1981	Jan-Sep 1981	Jan-Sep 1980	Full Yr 1980
THESE REFINERS' PRODUCTION, BY SOURCE						
			MONTHLY RATE			
From Primary (ores & concentrates)	4,051,341	4.1	3.9	3.9	3.6	3.4
From Coins	33,965	0.0+	0.1	0.2	1.8	1.4
From Old Scrap (used photo film & other products)	4,464,089	4.5	4.1	4.9	6.4	6.2
From New Scrap (in-plant clippings, waste)*	1,983,288	2.0	2.0	2.3	2.7	2.8
TOTAL PRODUCTION	10,532,683	10.5	10.1	11.2	14.5	13.9
TOTAL PRODUCTION Less New Scrap*	8,549,395	8.5	8.2	9.0	11.8	11.1
ABOVE TOTAL PRODUCTION, BY OWNERSHIP						
From Refiners' Own or Purchased Materials	7,590,391	7.6	8.1	8.2	9.4	9.2
Refined on Toll for Others	2,942,292	2.9	2.0	3.0	5.1	4.7
DISPOSITION BY THESE REFINERS						
Converted in Plant (consumed in fabricating, etc.)	2,889,718	2.9	3.1	3.3	4.8	4.9
Shipped Out: Own materials	5,291,122	5.3	4.7	5.0	4.8	4.5
Against Tolls	2,390,684	2.4	2.0	2.8	4.9	4.5
TOTAL DISPOSITION	10,571,524	10.6	9.8	11.1	14.6	13.9
TOTAL DISPOSITION Less New Scrap*	8,588,236	8.6	7.8	8.1	11.9	11.1
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)						
	-38,841	-0.0+	+0.3	+1.5	-0.8	-0.5
THESE REFINERS' STOCKS AT END OF PERIOD	2,573,003	2.6	2.6	2.6	0.8	1.1

Production and Disposition of **999 Silver Bars** by All Known Refiners in Australia, Canada, Mexico, Peru, South Africa and Sweden; and some other Refiners in Europe and Asia.

	TROY OUNCES		MILLION TROY OUNCES			
	September 1981	Sep 1981	Aug 1981	Jan-Sep 1981	Jan-Sep 1980	Full Yr 1980
THESE REFINERS' PRODUCTION, BY SOURCE						
			MONTHLY RATE			
From Primary (ores & concentrates)	12,497,398	12.5	11.7	12.1	12.1	12.0
From Coins	80,312	0.1	0.0	0.1	0.1	0.1
From Old Scrap (used photo film & other products)	4,383,612	4.4	5.0	5.4	7.8	7.4
From New Scrap (in-plant clippings, waste)*	800,467	0.8	0.9	1.0	1.4	1.4
TOTAL PRODUCTION	17,761,789	17.8	17.6	18.5	21.4	21.0
TOTAL PRODUCTION Less New Scrap*	16,961,322	17.0	16.7	17.5	20.0	19.5
ABOVE TOTAL PRODUCTION, BY OWNERSHIP						
From Refiners' Own or Purchased Materials	15,373,969	15.4	15.4	15.6	17.5	17.2
Refined on Toll for Others	2,387,820	2.4	2.1	2.9	3.9	3.8
DISPOSITION BY THESE REFINERS						
Converted in Plant (consumed in fabricating, etc.)	4,091,450	4.1	4.8	4.9	7.5	7.0
Shipped Out: Own materials	12,075,296	12.1	11.4	11.0	10.3	10.4
Against Tolls	2,578,063	2.6	2.0	2.8	3.3	3.3
TOTAL DISPOSITION	18,744,809	18.7	18.2	18.8	21.1	20.8
TOTAL DISPOSITION Less New Scrap*	17,944,342	17.9	17.3	17.8	19.7	19.3
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)						
	-983,020	-1.0	-0.6	-2.3	+2.4	+2.3
THESE REFINERS' STOCKS AT END OF PERIOD	5,287,133	5.3	6.3	5.3	7.7	7.6

* PRODUCTION From New Scrap is 999 silver made from in-plant clippings, spillage, sweepings, etc., generated during manufacturing processes; since it is in continuous cycle from new scrap to 999 silver, to new scrap, some like to see the production and disposition totals after deducting the new scrap from both.

THE SILVER INSTITUTE

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1001 Connecticut Avenue NW, Washington, D.C. 20036. Tel. (202) 331-1485 and 331-1228